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COOPERATIVE PLANT PEST CONTROL PROGRAMS

FISCAL YEAR 1959

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AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

COOPERATIVE PLANT PEST CONTROL PROGRAMS

Fiscal Year 1959

Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

372398

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COOPERATIVE PLANT PEST CONTROL PROGRAMS

The Plant Pest Control Division of the Agricultural Research Service has broad responsibility and authority for the control of agricultural pests in the United States. Programs in which the Division participates are cooperative with other Federal Agencies, affected States, and for certain pests, with the Republic of Mexico and Canada.

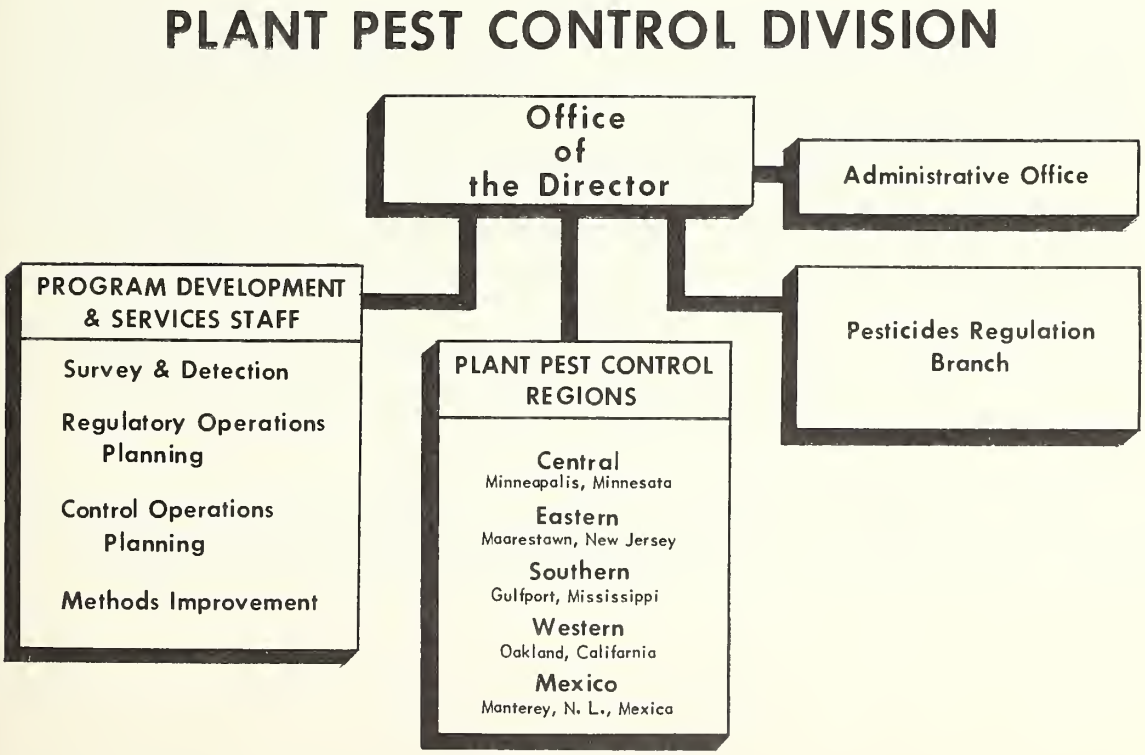
Programs concerning insects, plant diseases and nematodes involve survey, regulatory, control, and eradication procedures and fall into three broad categories: (1) Incipient infestations of newly-introduced pests which through joint effort may be eradicated or confined to very small areas; (2) introduced pests that have become established over substantial areas but not throughout their potential ecological range in this country; and (3) insects and plant diseases native to or generally distributed throughout their ecological or host range which outbreak periodically, causing widespread damage or destruction of crops in areas often remote from breeding grounds.

Other Division responsibilities include:

(1) Administration of the Federal Insecticide, Fungicide, and Rodenticide Act and its amendments.

(2) Assistance to the International Cooperation Administration and the governments of cooperating countries abroad in the development of practical insect control programs.

(3) Cooperative Economic Insect Survey and Detection Program to provide current information on insect distribution and abundance and the prompt detection of newly introduced pests of economic importance.



The Plant Pest Control Division operates under the authority granted the U. S. Department of Agriculture in the following general and specific Federal legislation: The Federal Plant Pest Act (Public Law 85-36); the Plant Quarantine Act of 1912, as amended (7 USC 151-167); the Pink Bollworm Act of 1930 (46 Stat. 67); the Incipient or Emergency Outbreak Resolution of 1938 (7 USC 148-148e); the Mexican Border Act of 1942 (7 USC 149); the Department of Agriculture Organic Act of 1944, as amended (7 USC 147a); the Insecticide, Fungicide, and Rodenticide Act of 1944, as amended (7 USC 135-135k); the Golden Nematode Act of 1948 (7 USC 150-150g); the Halogeton Glomeratus Control Act of 1952 (7 USC 1651-1656); and Public Law 518, the Miller Pesticide Residue Amendment to the Food, Drug, and Cosmetic Act of 1938 (68 Stat. 511).

Responsibility for preventing or retarding the spread of introduced pests is usually shared jointly by the affected States and the Federal Government. In this arrangement the Plant Pest Control Division carries out its function through (1) survey and detection work, (2) quarantine and regulatory operations, (3) control or eradication operations, (4) methods improvement operations, and (5) pesticides regulation. These activities are for the benefit of all States and the activities must be uniform among the States.

Surveys are basic to control or regulatory programs. Before a program can be carried out effectively it is necessary to know the extent of the problem and the areas in most critical need of attention. In some cases surveys provide a basis for forecasting insect trends and alerting responsible organizations and the growers for planning efficient control or eradication programs. In addition to surveys directly connected with established programs, attention is also directed to cooperative surveys involving other insect pests of economic importance. At the same time, the forecasts permit industry to produce and distribute supplies of pesticides that will be needed. The results of these surveys are published weekly in the Division's Cooperative Economic Insect Report.

Recent introductions of new pests to this country have emphasized the continuing need for early detection. A unified program is being developed to enlist the aid of all agricultural workers, entomologists, public health agencies, and others in a coordinated effort to locate new pests in their incipiency.

Any effort to control or eradicate an agricultural pest is seriously handicapped without supporting regulatory action. Regulations have to be invoked to prevent spread of infestations through commercial channels to farflung dispersion points. Confinement to the smallest possible area is the objective. By adequately regulating the movement of articles capable of carrying pests when shipped long distances, spread is retarded or effectively controlled. Once control or eradication procedures have begun, treated areas are protected from subsequent reinfestation by regulatory procedures.

Federal domestic quarantines regulate the interstate movement of products and things which may carry the pest. They do not provide protection against movement of hazardous products from the infested portion of a State to its noninfested part. States are encouraged to establish parallel quarantines to protect their uninfested areas.

Within the continental United States there are nine Federal domestic quarantines relating to insects, two concerning plant diseases, one relating to the soybean cyst nematode, and one involving witchweed. The Division also cooperates with the States in relation to their quarantines of the golden nematode, sweetpotato weevil, and the phony peach and peach mosaic diseases.

When a new pest capable of causing severe damage to crops becomes established in this country, in spite of all efforts to keep it out, the affected States and the Federal Government often join forces to eradicate, suppress or prevent further expansion of the infestation. In many instances these programs are of greatest benefit to the agriculture of noninfested States which cannot, except through

their Federal Government, contribute to the programs that protect them. An example of such a program, administered by the Plant Pest Control Division and the affected States, involves witchweed—a parasitic plant which attacks corn, sorghum, sugarcane, and other crops of the grass family. This pest, although important to the agriculture of North Carolina and South Carolina, would become much more serious if allowed to spread to other parts of the country where the principal host crops, corn, sorghum, and sugarcane are commercially more important.

The Division, through its methods improvement staff, adapts research results to action programs and develops better and less expensive ways of handling its operational problems. Pest control and eradication procedures continue to change as additional information is gathered or more effective procedures become available. This has necessitated program modifications to utilize the more effective procedures or materials. Better equipment is being developed, in cooperation with industry, to provide more accurate and uniform distribution of control materials. Constant surveillance on performance helps insure the success of cooperative eradication and control programs.

The Division, under the authority granted the U. S. Department of Agriculture, administers the Federal Insecticide, Fungicide, and Rodenticide Act and its amendments. This legislation provides assurance to farmers and other users of pesticides that these products, when used in accordance with official recommendations, can be depended upon to control pests without being injurious to people, useful plants, and animals. The act protects the public from the sale of worthless or dangerous materials by authorizing the Department to give careful scrutiny, before marketing, to formulas and labeling of pesticides. Samples of pesticides collected from dealers' stocks and importations are checked to determine compliance with the law. If they are in violation, appropriate corrective action is taken by the Department. Operations under the Act have greatly contributed to wider public confidence in the use of pesticides, resulting in substantial savings to crops and livestock.

The present Foreign Technical Assistance Regional Insect Control Project operates under a general memorandum of agreement between the U. S. Department of Agriculture and the International Cooperation Administration. The Plant Pest Control Division has been designated as the functional agency responsible for implementing this agreement. This program began with a request from Iran in 1951 for help in combating a severe outbreak of the desert locust. The success of this work prompted similar requests from other countries of the Near East, South Asia, and Africa. As the locust control work declined, the cooperating countries expressed the need for assistance to establish practical insect control procedures involving other pests. The present program includes pilot training, control demonstrations, regulatory procedures, and other activities associated with pest control. A significant feature of this cooperative effort is the steady increase of local government participation, with a corresponding decrease in American financial support.

A review of each of the programs of a regulatory, eradication, or control nature in which the Plant Pest Control Division actively participated during the fiscal year 1959 is presented on the following pages.

BARBERRY ERADICATION

History: Stem rust has been recognized as a serious disease of cereal crops in this country since the very beginning of American agriculture. Even before the time of the Revolutionary War, farmers observed stem rust in their grain crops and suspected barberry bushes of being the source of the disease. Colonial laws condemning the barberry were in existence before the relationship between rust on the barberry and that on grain had been proved.

Nature of Disease: Stem rust is caused by a fungus that lives alternately on certain species of barberry and mahonia and on grains and grasses. It is spread between host plants by windborne spores. It survives winter temperatures in the black spore stage on the straw of grains and grasses. The fungus infection develops on the leaves of the barberry in the spring and from there spreads to grains and grasses. Once stem rust becomes established in grain fields, it spreads from plant to plant and from one field to another until harvest time. As the crops mature the black stage again forms on the ripening straw, thus completing the life cycle.

Races of the stem rust fungus crossbreed on the barberry and produce new hybrid races, some of which are capable of attacking grains previously considered resistant. The eradication program therefore serves two purposes: It eliminates the early local sources of stem rust and it destroys the host on which new races of the fungus are produced.

Survey, Quarantine and Eradication: The organized cooperative barberry eradication program was started in 1918. The objective of the program is to protect small grain from damage caused by stem rust.

The enforcement of Federal and state quarantines prevents the re-establishment of susceptible barberries in areas that have been cleared. The black stem rust quarantine regulates the interstate movement of plants, seeds, and fruits of Berberis, Mahonia, and Mahoberberis to protect small grains from the rust which develops part of its life cycle on those plants. Rust-resistant species of Berberis, Mahonia, and Mahoberberis are permitted to be moved interstate from inspected and approved nurseries. Interstate movement of rust-susceptible species is prohibited. In general, seeds and fruits of Berberis, Mahonia, and Mahoberberis may be moved between and from eradication states under permit and without regulation between noneradication states.

Barberry bushes are killed with herbicides — Ammate applied to the cutoff cane surface at the ground level after the canes are clipped off, or with sprays of 2,4-D and 2,4,5-T, or combinations of the two applied to the foilage and canes. Barberry eradication when carried to practical completion will have eliminated permanently the source of early stem rust epidemics and the important source of new races. The red stage of stem rust survives the winter months in Mexico and Texas. Occasionally it is carried northward by the wind in quantity and under conditions which cause losses in northern grain producing areas. Barberry bushes serving as sources for earlier spread of stem rust in the Northern States are gradually being eliminated by the eradication program.

The Current Situation: The 19 states participating with the Federal Government in the program produce approximately 2-1/4 billion bushels of wheat, oats, barley, and rye on 93 million acres each year. These crops represent more than $3 billion of annual income. Stem rust reduces both field production and quality of these crops. During the year ending June 30, 1959, 3,354,151 barberry bushes were destroyed. These bushes were found on 2,801 properties distributed over approximately 7,532 square miles. Of this area, 5,913.5 square miles were placed on maintenance and will require only sufficient work in the future on infested sites to maintain the barberry-free condition. Of the 7,548 previously infested sites inspected 5,337 were without bushes in 1959. The total area in the 19 states requiring future work now approximates 49,700 square miles.

North Dakota, South Dakota, Montana, and Wyoming are now operated on a maintenance basis and the work remaining in Colorado, Illinois, Indiana, Missouri, Nebraska, and Kansas is approaching the maintenance stage. Maintenance work is largely financed by state funds and is designed to keep the territory free of susceptible barberry and mahonia plants. Barberries still exist in many parts of Minnesota, Michigan, Iowa, Ohio, Wisconsin, Pennsylvania, Virginia, and West Virginia, largely in areas that have been worked initially. Timely rework in these areas is necessary to accomplish complete eradication of this plant pest.

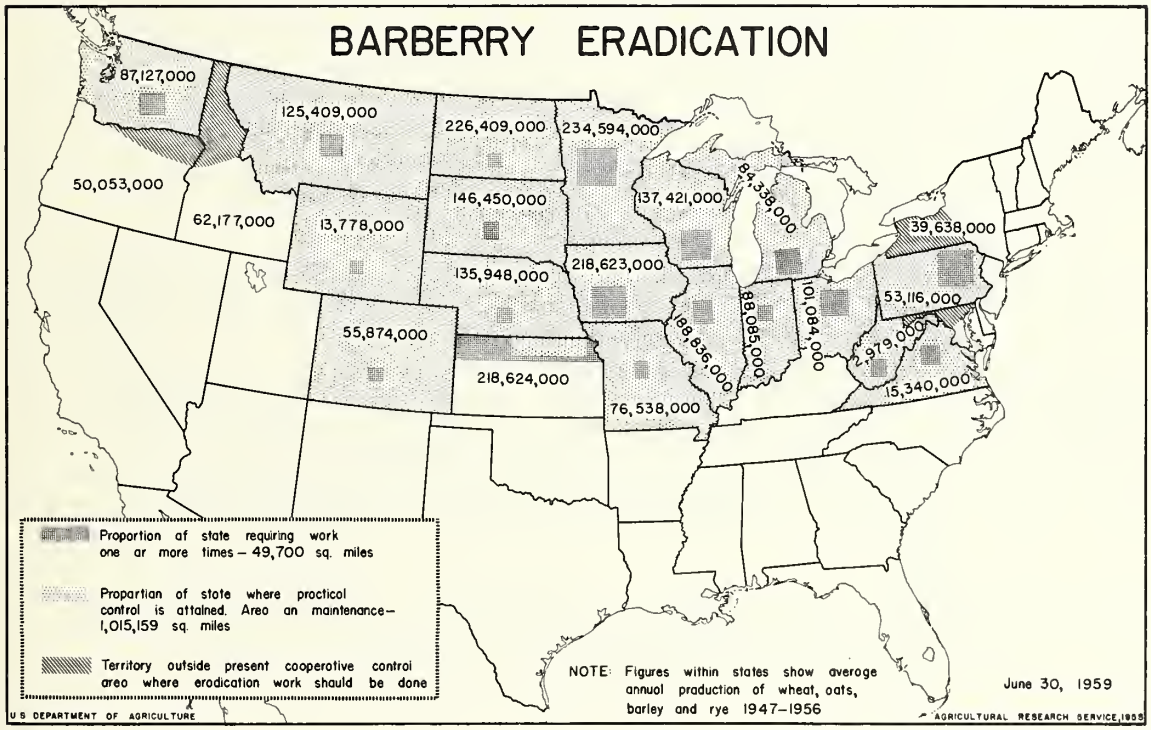
Most Recent Department Informational Aids:

Publication: Barberry Eradication In Stem Rust Control, Leaflet No. 416, 1957.

Quarantine: Federal and State.

Film: Stem Rust (Color, 16 mm., released 1950, revised 1956, 13 minutes).

Slides: Series of 17 slides with legends, April 1958. Available for loan.



BURROWING NEMATODE

History: The burrowing nematode (Radopholus similis) was discovered in the Fiji Islands in 1890 and has since been reported from Jamaica, the Hawaiian and Philippine Islands, Formosa, South India, Dutch East Indies, Java, Brazil, Central America, Puerto Rico, and Florida in the U.S.A., on banana and other plants. It is believed to have existed in Florida for at least 30 years where it is now recognized as being a serious pest of citrus. It has not been found on commercial crops in any other state.

Nature of Pest: The burrowing nematode is a small, parasitic eelworm approximately 1/40 inch long. It lives in roots of trees and other plants. The female deposits eggs inside the rootlets. The eggs develop into larvae which feed on the roots of the hosts. The life cycle is completed in about 30 days. Infestation is spread concentrically about 50 feet each year.

The burrowing nematode stunts citrus and avocado trees. The stunted condition is called "spreading decline." Its symptoms are sparse foilage, undersized leaves, and small fruit. The parasite attacks the roots of citrus and some 115 other species of plants, including ornamentals and weeds. The host plants serve as nematode carriers. More than 11,038 acres of citrus, involving 2,210 properties in Florida, are now known to be affected. Reductions in yields of 50 to 80 percent for grapefruit and 40 to 70 percent for oranges have been reported as resulting from severe infestations of this pest.

Survey, Quarantine, and Control: The burrowing nematode program involves: (1) Surveys to delimit areas of infestation; (2) enforcement of state regulatory measures regarding infested nurseries, including supervision of the hot-water treatment of citrus nursery stock; and (3) removal and destruction of infested trees and plants and treatment of soil with a fumigant. The Plant Pest Control Division assists the State Plant Board of Florida in: (1) Detection of infestations; and (2) supervision of measures regulating movement of nursery stock to prevent spread of the pest, and measures to free nurseries of the nematode. In addition, surveys are made to determine if the disease is present in other citrus-growing areas of the country. The containment program carried on by the State up to March 1959 called for the removal of all citrus trees affected, plus four additional rows of adjacent trees outward from the border of infestation, and fumigation of the soil with D-D at 600 pounds per acre. A ruling by the Florida Supreme Court in March made it necessary to completely revise the program.

The State Plant Board of Florida has the responsibility of administering burrowing nematode control measures. These measures involve the removal of infested trees from citrus groves, hot-water treatment of nursery stock originating from infested citrus nurseries, and the treatment of ornamental nurseries.

The Current Situation: During fiscal year 1959, burrowing nematode work carried on by Plant Pest Control Division personnel was primarily concentrated on margin inspections of previously pushed and treated areas, delimiting extensions of such areas, and nursery inspections. The major amount of detection survey was conducted by State Plant Board personnel. Although a number of groves were found positive for the first time, no additional large areas of infestation were discovered. Nursery site approval inspection was in operation during the entire year.

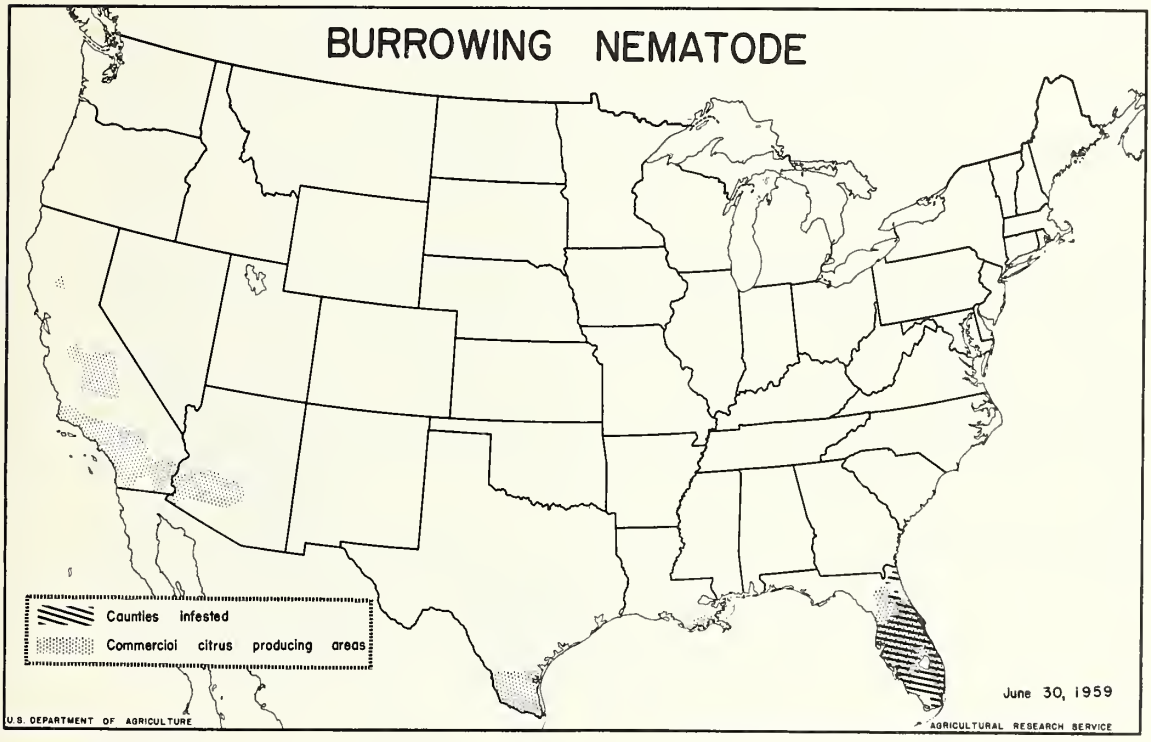
The March ruling of the Florida Supreme Court resulted in the outlining of a new program by the State Plant Board and research and industry personnel to accomplish the objective of eradication in commercial groves with a minimum outlay of compensation for trees pushed. This revised program was approved by the State legislature and funds made available for carrying on the work.

During the 1959 fiscal year, 859 citrus groves, representing 18,280 were surveyed. New infestations were discovered in 104 groves, with an accumulative total of only 188 acres. Infestations in 118 groves, containing 312 infested acres, and 500 acres of extensions to previously pushed and treated areas were delimited. A total of 939 nurseries were surveyed. Infestation was found for the first time in 46 citrus nurseries consisting of a total of only 8 acres, and in 24 ornamental nurseries, with a total of approximately 7 acres. The Division laboratory processed a total of 88,466 root samples, of which 3,371 samples were found to be positive.

Most Recent Department Informational Aids:

Quarantine: State.

Slides: Series of 21 2x2 slides with legends, May 1958. Available for loan.



CITRUS BLACKFLY

History: The citrus blackfly (Aleurocanthus woglumi) is of Asiatic origin. It was found in the New World about 1913. In the United States, the first infestation was observed in 1934 in Florida and subsequently eradicated. In 1935 it was found on the west coast of Mexico and from this point it spread rapidly to the east and north toward the citrus-producing areas of Texas, Arizona, and California. It was found in the United States at Brownsville, Texas, on May 31, 1955.

Nature of Pest: The citrus blackfly is not a true fly but is related to scale insects and aphids. The adult is a dark, bluish-colored, four-winged insect about 1/16 of an inch long. The pest spends most of its life in a stationary, scale-like form with its beak imbedded continuously in the citrus leaf tissue, almost completely stifling the vitality and productivity of the tree. It can reduce a citrus tree to unproductivity more quickly than any other citrus pest known today. A two-year uncontrolled infestation has been known to result in a total crop failure. This insect has caused very severe damage to citrus plantings in Mexico, and it could be equally as destructive and very expensive to control if allowed to become firmly established in the citrus-producing areas of the United States.

Survey, Quarantine, and Eradication: Citrus blackfly surveys have been conducted cooperatively in northern Mexico since 1949 by the Plant Pest Control Division and the Mexican Defensa Agricola. The objective is to locate and eradicate infestations before they become so large that eradication becomes impossible. The Mexican Defensa Agricola applies the control measures and enforces quarantines in the States adjoining the International Border. Excellent results have been achieved in Mexico and many infestations have been eradicated. Reinfestations along the Border in Mexico occur through movement of contraband infested products from States to the south. All newly discovered infestations or reinfestations in northern Mexico border zone are eradicated immediately by spraying the infested trees. The Mexican Defensa Agricola is using 3 applications of 180 cc. of 50 percent malathion to 100 lts. of water as the eradication treatment.

In Texas, eradication by the State Department of Agriculture is accomplished by the application of three or more sprays at 21-day intervals. The standard spray formula contains 1-2/3 gallons of light emulsive oil, 1/2 pound chemical containing 5 percent rotenone, and 100 gallons of water. More recently, malathion is being used in many instances as a replacement for the standard spray.

No Federal quarantine against this pest is in effect. Even though all known infestations have been eradicated, others will undoubtedly occur. Recent expansion of transportation facilities in northwest Mexico has greatly increased the hazard of spread through increased travel and movement of products. The pest is of mutual concern to Mexico and the United States.

The Current Situation: In the United States, Texas is the only actively participating State in the citrus blackfly work. No citrus blackflies have been found in Texas following the treatments applied on all infestations found in 1955 and 1956. The last 14 infestations on record were found during July and August of 1956. During the period July 1, 1958, to June 30, 1959, 230,139 trees were inspected on 14,609 properties in Texas. During the fiscal year ended June 30, 1959, surveys conducted south of the border in Mexico from Sonora east through Tamaulipas, included 1,413,172 trees on 26,985 properties and revealed 270 properties with 1,554 infested trees.

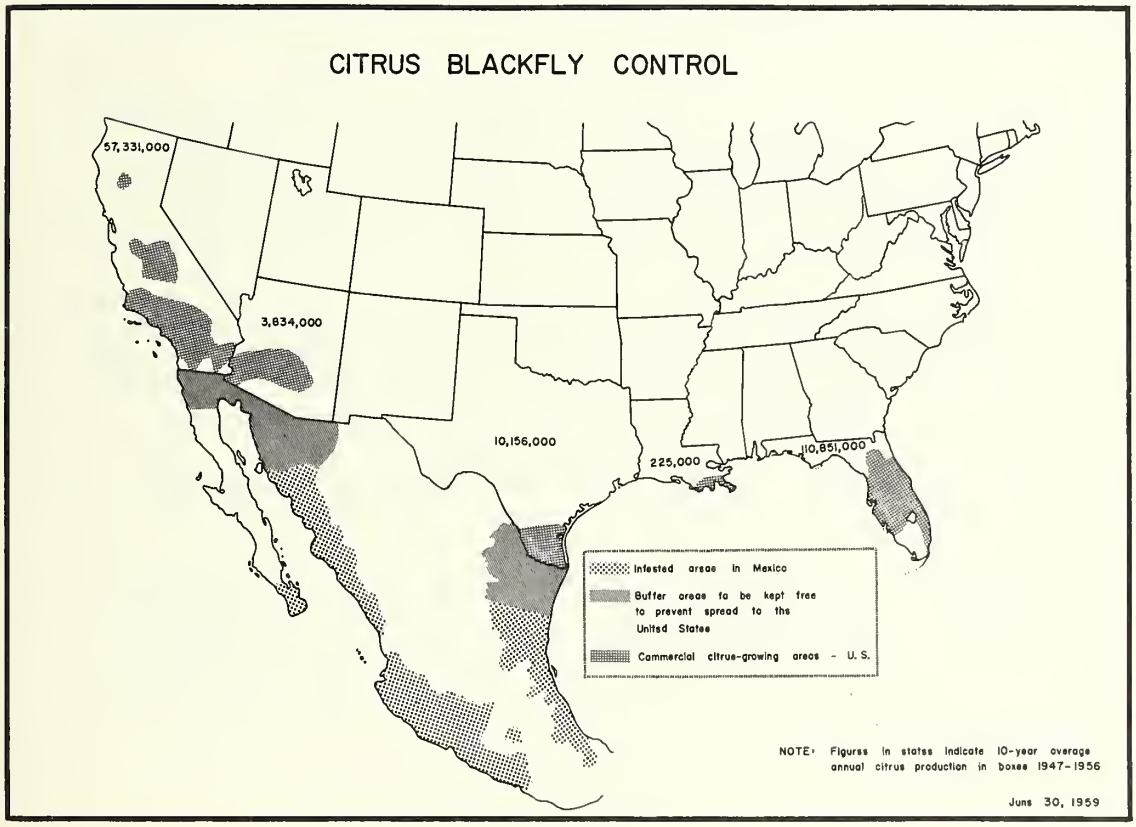
The Cooperative Program with the Mexican Defensa Agricola continues in maintaining the States and portions of States of northern Sonora, Baja California, northern Tamaulipas, and Nuevo Leon free of the citrus blackfly. The area north from Hermosillo, Sonora, to the border is maintained as a blackfly-free area. Infestations found occasionally in this area are immediately treated to eradicate

the pest. About 80 miles south of Hermosillo at Guaymas, Sonora, the general infestation has been reduced to the point of effective control by a combined parasite release and spray program. In southern Sonora and all of the State of Sinaloa, control by means of parasite releases is generally proving to be effective.

In northern Tamaulipas and the State of Nuevo Leon, control is maintained by means of insecticidal sprays. Southern Tamaulipas and the states south are under biological control. Work in Mexico is supervised by the Mexican Defensa Agricola. At points just north of the biological control zones, in the east as well as the west, road stations are maintained by the Defensa Agricola for the purpose of intercepting plant material which might be a carrier of the insect.

Most Recent Department Informational Aids:

Slides: Series of 10 2x2 slides with legends, December 1957. Available for loan.



EUROPEAN CHAFER

History: The European chafer (Amphimallon majalis) was found for the first time in this country in western New York in 1940. It is thought to have been brought here earlier with plants from France. It is now known to occur in nine counties in western New York and has been found in one county each in the States of Connecticut and West Virginia. In March of 1959 it was found in the Brooklyn and western Long Island areas.

Nature of Pest: The larvae, or grubs, feed on roots of plants, damaging pastures, turf, hay crops, alfalfa, and small grains. During June and July the yellowish-brown beetles emerge from the soil at dusk in a mating flight, swarming about trees and shrubs with a buzzing noise. They feed sparingly, if at all.

Survey, Quarantine, and Control: Beginning in 1942, the New York State Department of Agriculture and Markets assumed the responsibility of carrying out regulatory procedures governing the movement of products and other carriers from infested areas within that State. Much of the related research has been done by the New York State Experiment Station. Other agencies within the State have done much of the survey work.

The program was strengthened in 1955 by promulgation of a Federal quarantine which became effective in September of that year. Connecticut, New York, and West Virginia are quarantined because of the European chafer. Application of the regulations is limited to infestation in western New York; a limited area in New Haven County, Connecticut; and a small part of Hampshire County, West Virginia. Movement of the soil, either independently or with other articles, is the chief means of spread of chafer grubs. Treatments include soil insecticides, dips, soaks, and fumigation. The regulated industry has cooperated in the quarantine enforcement program.

Federal funds are used for regulatory work, scouting, and control in the infested areas, and for special cooperative surveys in other states. Grub-adult mounts and literature about the chafer have been distributed to all State regulatory officials to aid in the cooperative survey. Soil treatments for eradication purposes have been applied on a Federal-State cooperative basis to all isolated infestations in New York and the known infestations in Connecticut and West Virginia. The cooperating states have made substantial contributions in services and funds for regulatory, survey, and control work.

Research is underway to improve soil and plant treatments necessary for quarantine compliance. Efforts are being made to develop a more effective trap, with sex, sound, or light attractants. A more effective trap is especially needed for surveys outside the known infested areas, as well as for determining the degree and extent of spread in the areas under regulation. Cooperative Federal-State research agencies are making tests to develop improved detection techniques.

Inspection activity within the Capon Bridge, West Virginia, area during the fiscal year failed to reveal any continuance of European chafer infestation. Determinations on suspicious specimens collected in 65 traps set in this area all proved to be negative.

The Current Situation: During the year more than 28 million dollars' worth of regulated products moved safely under Federal-State certificate from the infested area. Nursery stock, soil, sand, and gravel are the principal products under regulation. Shippers bear the entire cost of fumigation or soil treatment with insecticide under Federal-State supervision. Such treatments are the main basis upon which certificates are issued to permit movement of regulated products from infested areas.

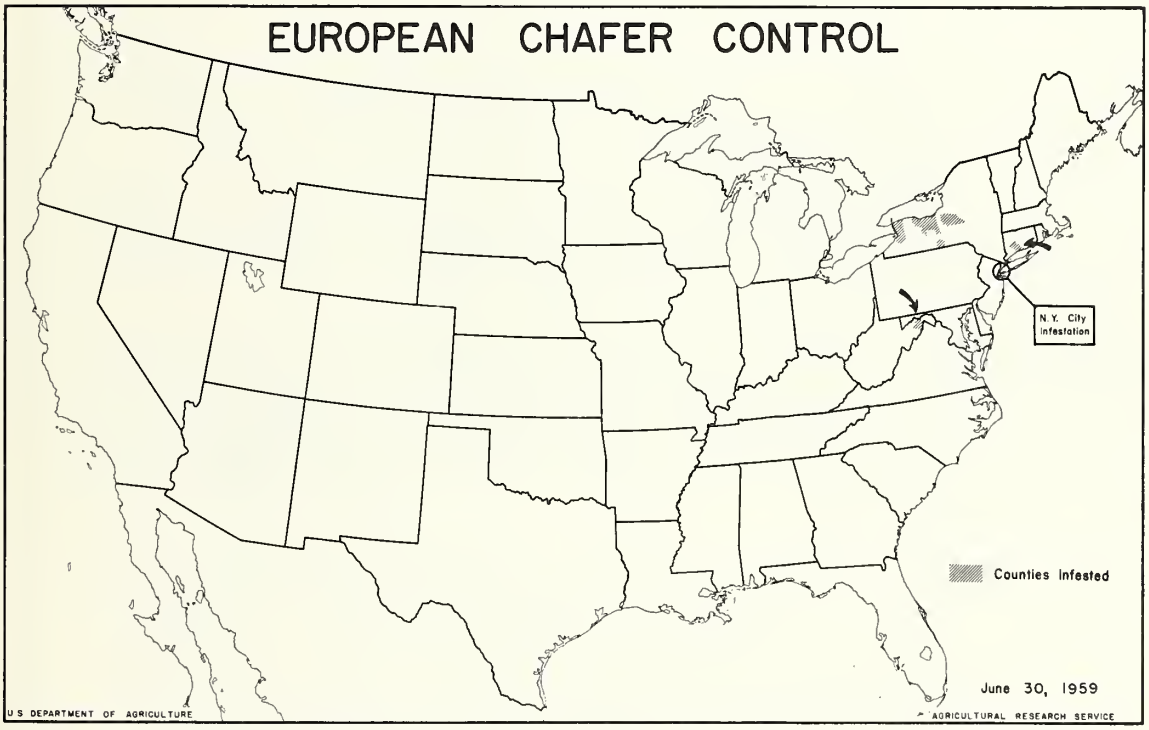
Intensified surveys, largely within the regulated area, to delimit actually infested properties revealed an additional 53,960 acres to be harboring European chafers. About 1,000 additional acres were found to be infested beyond the area under Federal quarantine regulation. The development of an effective survey method is a continuing problem. Baited traps showed promise but are not yet adequate. Black light traps, while showing some promise during the 1959 trapping season, have yet to demonstrate adequacy for program needs. Research on this and other phases of survey techniques is being continued.

Since 1955, more than 3,526 acres have been treated with soil insecticide to destroy larvae and adults in nurseries and outlying spotted infestations. No beetles have been found for two or three years in several isolated points of infestation where such treatments were applied, including that at Capon Bridge, West Virginia. Additional treatments were applied to the area at Meriden, Connecticut, where there was some extension of the infestation.

Most Recent Informational Aids:

Publications: In preparation.

Quarantine: Federal.



GOLDEN NEMATODE

History: The golden nematode (Heterodera rostochiensis), a major pest in Europe for many years, was discovered in the United States for the first time in 1941 in Nassau County, Long Island, New York.

Nature of Pest: Eggs and larvae of the golden nematode pass the winter in a thick-walled, protective cyst. In the spring, in the presence of host plants, the eggs hatch and the larvae attack the roots. After penetrating the root, the larvae undergo a series of changes; the males move freely, while the females become more or less stationary. The female body enlarges and breaks through the outer layer of the root. After fertilization, it continues to enlarge and becomes a protective cyst encasing eggs and larvae of the next generation.

Potatoes and tomatoes are considered as principal hosts of economic importance. This nematode injures the root system and causes stunting and dying of plants and reduced crop yield. On Long Island, nematologists have found potato yields reduced as much as 85 percent on land severely infested with golden nematodes.

Survey, Quarantine and Control: The Plant Pest Control Division, in cooperation with the New York State Department of Agriculture and Markets, is conducting a program to prevent spread of the nematode from Long Island and to reduce nematode populations on known infested land. In other important potato-growing states, periodic detection surveys are made to determine the presence of the nematode. The periodic surveys conducted since 1945 in the potato districts of the United States have failed to reveal the established presence of golden nematode outside of Long Island, New York. In fiscal year 1959 surveys conducted on 74,166 acres in New Jersey, Maine, New Hampshire, Vermont, Illinois, Missouri, Arizona, California, Montana, Wyoming, Florida, Mississippi, and North Carolina showed negative results.

A New York State quarantine was invoked in 1944. The regulated area includes all of Nassau and Suffolk Counties on Long Island. The Division cooperates with New York State in the enforcement of the provisions of the quarantine. As long as golden nematode continues to be a threat to the potato and tomato industries, survey, quarantine, and control measures in New York State will continue.

As infestations are found, the land is removed from host-crop production. The low discovery rate of new infestations, despite diligent and extensive inspections and the low populations in existing infestations demonstrate the effectiveness of the current program. The cooperative Federal-State program has resulted in confining this pest to a relatively small area on Long Island.

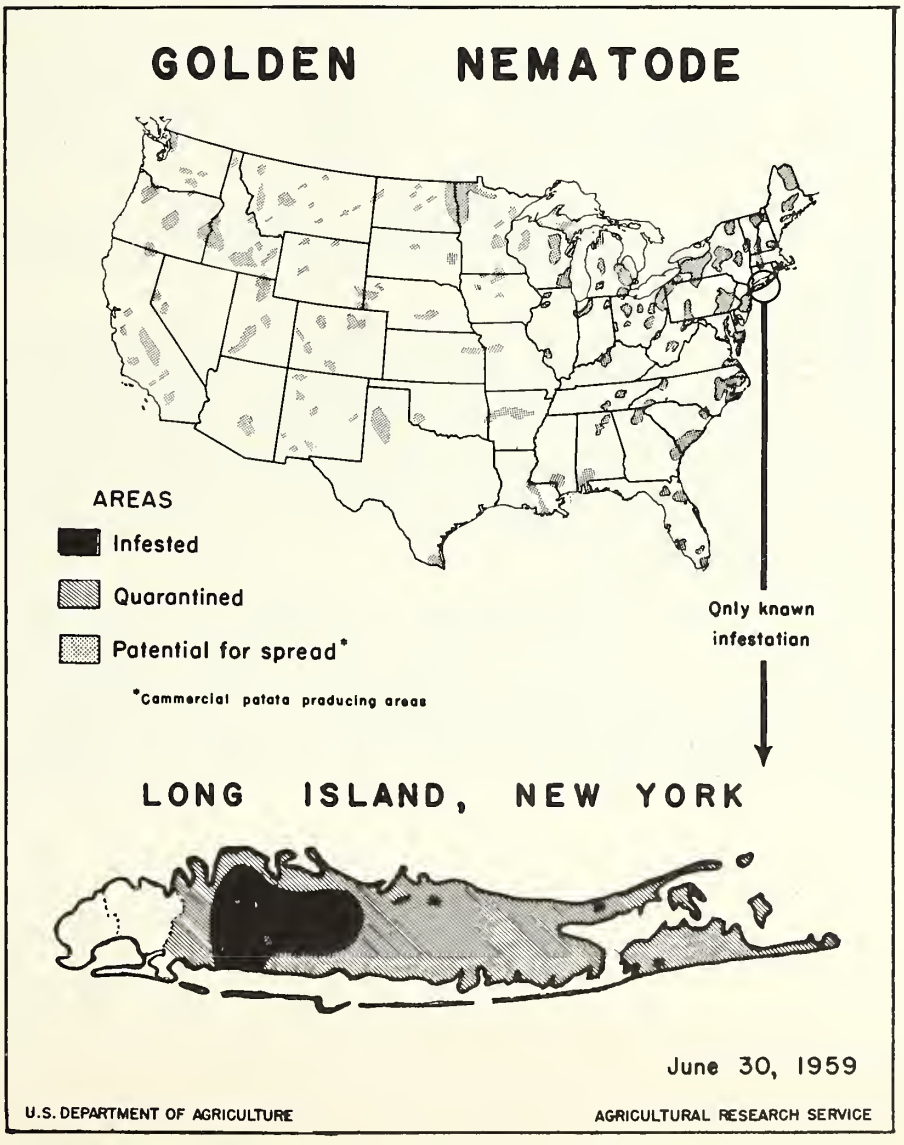
The Current Situation: Fiscal year 1959 field surveys on Long Island added only 11 new properties, with a total of 582 acres, to the infested area. This is the fourth consecutive year that the number and extent of new infestations have continued at a low level. Since golden nematode was discovered on Long Island in 1941, a total of 14,233 acres have been found infested. Housing and industrial developments by June 30, 1959, have permanently removed 7,733 of these acres from agricultural use. Early quarantine action when the pest was first found, and the immediate retirement of infested land from host-crop production, have contributed to reducing infested acreage.

Methods improvement work continues in an effort to find possible chemical means of eradicating the golden nematode. In 1956, field-scale tests were inaugurated on three fields in an effort to eradicate the nematode by chemicals. The nematocide was applied at a rate of 900 pounds per acre in two applications of 450 pounds each, 10 days apart. Potatoes were planted on land each crop year. Laboratory results for the 1957 crop year indicated complete kill of cysts. Work continues in an effort to increase efficiency of equipment for applying nematocides for eradication of the golden nematode. The use of a colter-joiner attached to a

moldboard plow for turning the top 3 inches of soil to the bottom of the furrow during preparation for the second treatment insures effective distribution of the nematocide in the soil. A gravity flow system for metering the nematocide into the soil behind the plow shanks has replaced a pressure system used previously. This system utilizes flow-regulating coils which assure continuous flow of the nematocide to the bottom of the shanks.

Most Recent Department Informational Aids:

Publications:	The Golden Nematode of Potatoes and Tomatoes, Leaflet No. 361, May 1954.
	The Golden Nematode of Potatoes, Circular No. 875 August 1951.
Quarantine:	State.
Film:	The Golden Nematode (Color, approximately 27 minutes, produced by Cornell University).
Slides:	Series of 16 2x2 slides, February 1958. Available for loan.



GRASSHOPPERS

History: Grasshoppers are native to the United States and are generally distributed throughout all states. The most severe outbreaks occur in the Midwestern and Western States. The first well-organized grasshopper control program involving Federal participation was initiated in cropland areas in the Midwestern States in 1934.

Nature of Pest: Most species of grasshoppers hatch during the spring months from eggs deposited in the ground the previous season. The nymphs develop into adults during the summer. The adults deposit their eggs in the summer and fall and then die. These pests feed on a wide variety of host material including forbs, cultivated crops, and range grasses. Under outbreak conditions, grasshoppers frequently destroy all of the vegetation in an infested area. In many cases, even light populations cause severe damage. The Laboratory of the Agricultural Research Service, Entomology Research Division, Bozeman, Montana has estimated that the average annual loss to crops and range forage combined in the 17 states west of the Mississippi River approximates $90,000,000.

Survey and Control: The immediate objective of the control program is to destroy infestations of grasshoppers before they seriously damage current season's planted and range crops. Division personnel provide technical leadership and direction in evaluating the problem, planning and executing control, and determining results. The work falls into four main categories: (1) Continuing annual surveys to locate and evaluate infestations; (2) participation in control of infestations on roadsides, idle lands and rangelands, particularly when migratory species are involved and there is danger of spread over wide areas, and when local facilities are inadequate to handle the problem; (3) control on federally-owned land in cooperation with Federal land-managing agencies; and (4) provision of technical assistance and program services to farmers who finance local control on croplands. Control is now achieved through the use of insecticide sprays applied with ground or aerial equipment. Two ounces of aldrin or heptachlor per acre in one gallon of diesel fuel oil provided effective control in 1959.

This work is cooperative. The States, counties, landowners, the Plant Pest Control Division, and other Federal agencies participate financially in the program. Insecticidal applications are made by contract aircraft or federally-owned ground equipment.

The Current Situation: Cooperative grasshopper surveys completed at the end of the 1959 season indicate that moderate or higher populations may be expected on 5,667,000 acres of range in 13 Western and Midwestern States in 1960. According to the surveys, it is expected the 1960 infestations will be composed of the typical rangeland grasshoppers. The migratory grasshopper infestation should not be extensive. A note of interest involves Dissosteira longipennis. This species which caused severe damage to range in the High Plains States, principally in Colorado, in the middle and late 1930's through 1940 was recorded at 42 locations in 15 north Texas counties and in 5 eastern New Mexico counties in the fall of 1959. This is the highest concentration since they were successfully controlled at the close of the 1940 season.

The influence of the cooperative Federal-State grasshopper control program carried on in 13 Western States during 1958, plus the effects of early spring weather, was reflected in the reduced need for control work in 1959. In contrast to 1958 when 4,338,329 acres of range, roadside, and wasteland were treated, only 766,478 acres required attention this past season, distributed over 8 States. In Colorado, Kansas, Oklahoma and Texas, where the bulk of grasshopper control was needed in 1958, no cooperative control was necessary in 1959. Two seriously infested areas in New Mexico where control work was requested and a suppression

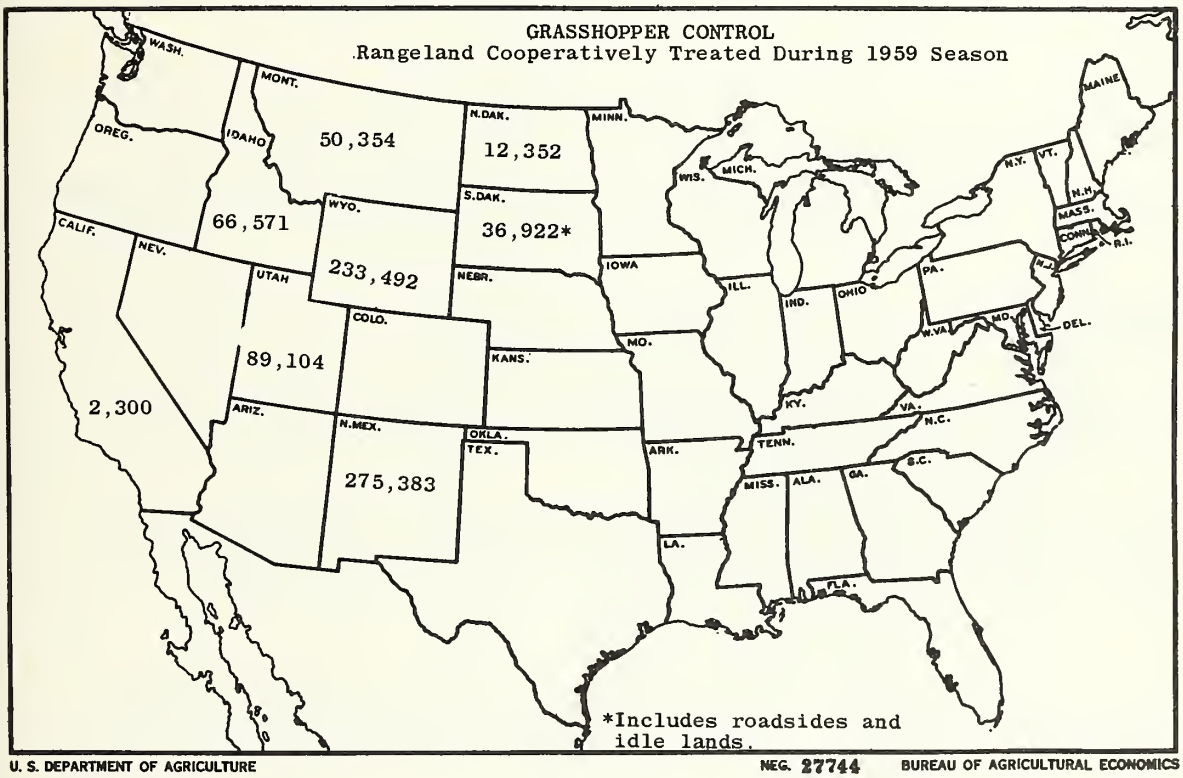
program in Wyoming accounted for the bulk of the area treated this past season. Other States, including California, Idaho, Montana, North Dakota, South Dakota, and Utah, treated smaller endemic infestations to prevent migration into nearby croplands and continued spread into the surrounding rangeland.

Most Recent Department Informational Aids:

Publication: Grasshoppers, A New Look at an Ancient Enemy, Farmers Bulletin No. 2064, revised May 1957. The High Plains Grasshopper, Technical Bulletin No. 1167, January 1958.

Film: Grasshoppers Can Be Controlled. (Color, released 1955, 21-1/2 minutes.)

Slides: Series of 22 2x2 color slides. Available for loan.



GYPSY MOTH

History:

The gypsy moth (Porthetria dispar L.) was brought into the United States in 1869 from France by an amateur entomologist, who believed he could breed the insect with silkworm moths. The pest escaped from his rearing laboratory at Medford, Massachusetts. For the next 20 years little was heard of the defoliator, but in 1889 a severe outbreak stripped fruit and shade trees in many towns in the area. In answer to public demand, the State of Massachusetts appropriated funds for eradication of the pest which by then occurred in a 350 square mile area. Due to success of the control work and to low populations in 1898-99, the public believed that the danger had passed and the campaign was terminated in 1900.

The population immediately built up to enormous numbers and the State resumed control work in 1905. By this time, the pest had spread to over 2,000 square miles in Massachusetts and in isolated areas of Maine, New Hampshire, and Rhode Island. In 1906 Congress appropriated funds to assist cooperating States in preventing spread of the gypsy moth. Despite intense control and containment efforts, the pest continued to spread.

In 1923 a cooperative Federal-State control program and a moth free barrier zone, thirty miles wide extending along the eastern border of New York from Canada to Long Island, was established to prevent further spread to the west. This proved effective until 1938 when a hurricane carried egg cluster fragments beyond the zone. Isolated infestations of the gypsy moth were subsequently found in Pennsylvania and New Jersey. In 1954 a small infestation was found in Lansing, Michigan.

Nature of Pest: The gypsy moth has only one generation a year. The insects pass the winter as eggs which hatch the latter part of April and early May. The larvae are voracious feeders on oaks, poplars, willows, apple, basswood, gray and river birch, and other deciduous and evergreen trees. In July the larvae enter a resting or pupal stage and emerge the latter part of the month or early August as moths. The male moths are strong fliers while the female being very heavy bodied does not fly. Eggs are deposited on stones, trunks of trees, fences, and other objects nearby.

Wind is the principal means of natural spread, occurring when larvae are first hatched usually before they feed on foliage. Man also contributes to the spread of this pest by moving articles infested with egg clusters.

Damage is caused to trees and shrubs by larval defoliation which retards growth. Repeated defoliations weaken and often kill the trees outright. Hemlock seldom survives a single defoliation. Weakened trees are susceptible to diseases and attacks of other insects, notably bark borers.

Survey, Quarantine, and Eradication: Sex-attractant traps are used extensively in current survey operations to determine the distribution of the gypsy moth and for checking the results of eradication programs. The supply of natural sex-attractant has always been difficult to obtain. Research is now underway to find a method to synthesize an artificial lure which can be substituted for the natural material.

Interstate movement of forest and quarry products and other commodities which constitute a spread hazard is regulated by Federal Quarantine No. 45. Intrastate movement of these materials is controlled by parallel state quarantines in States which are partially infested. The Federal gypsy moth and brown-tail moth quarantine was revised and related administrative instructions designating regulated areas issued, effective July 20, 1956.

Eradication is the long-range objective of this program. In the spring of 1954 an eradication program was begun in Michigan. The program is continuing and as new infestations are found they are scheduled for treatment. In 1956 the Congress provided funds to begin a long term eradication program in the generally infested area in the New England States and New York. This program was immediately placed in operation and continued until insecticide residue problems were encountered. Studies are being continued to find alternate safe insecticides to assist in coping with the problem.

The Current Situation: The New York State gypsy moth program is the key to the future control of spread. This infestation forms the southern and western boundary of the generally infested area. Trap catches and defoliation surveys indicate a general buildup is underway throughout the northeastern States.

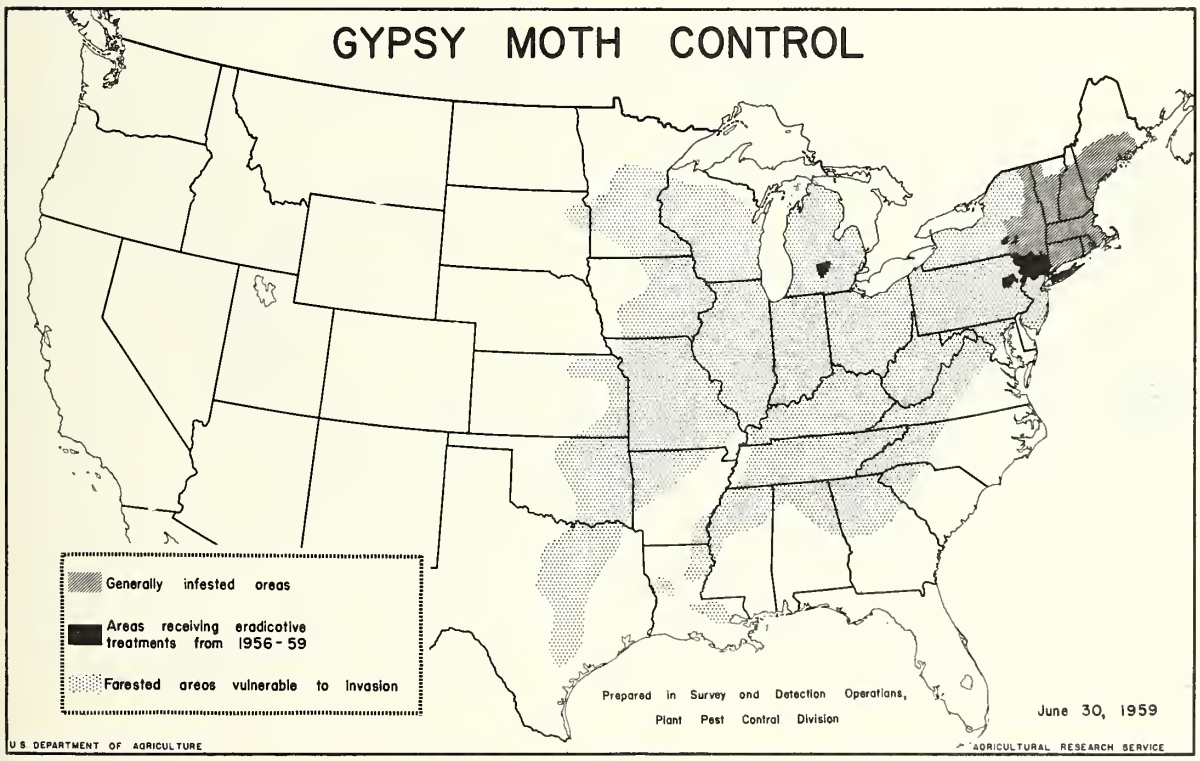
During the fiscal year 1959 a total of 105,651 acres was treated under the cooperative Federal-State eradication program. Another 44,770 acres were treated to suppress populations in 5 States within the generally infested area.

Most Recent Department Informational Aids:

Publication: The Gypsy Moth, PA 285, February, 1956.

Quarantine: Federal and State.

Slides: Series of 24 2x2 slides with legends, February 1958. Available for loan.

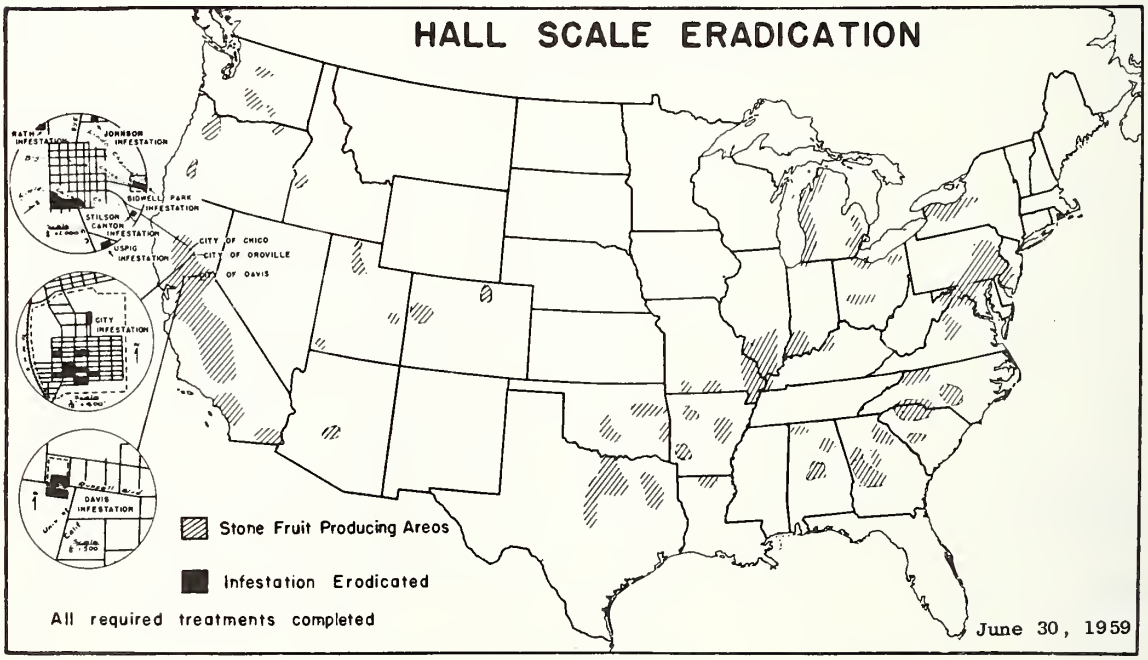


HALL SCALE

History: Hall scale (Nilotaspis halli) is common throughout the Middle East. It was first found in the Western Hemisphere in 1934, infesting stone fruits in the experimental plantings of the U. S. Plant Introduction Garden at Chico, California. Immediately following discovery, the California State Department of Agriculture eradicated the infestation, but the scale was again found in the Garden in 1940 and from there it spread to a nearby large commercial orchard. Since 1941 the State of California and the U. S. Department of Agriculture have cooperated in the eradication of the pest. Later, surveys in California and other Western and Gulf Coast States revealed eight localized infestations in the vicinity of Chico, Oroville, and Davis, California. The last infestation was found in 1956.

Nature of Pest: The young crawlers are found on all parts of the host. Many of these, especially the females, settle in protected places, such as deep crevices in wood, and under loose bark and bud scales, making inspection and control difficult. Nearly 2,000 scales have been found on one almond hull. Peaches, nectarines, plums, and prunes are also subject to heavy infestation. One and a partial second generation occur between the time the first oval, pale yellow crawlers emerge in late March and the middle of October when the scale is found on all parts of the host. The scale damages current tree growth, malforms fruit, and causes fruit losses of as much as 25 percent.

Survey, Quarantine, and Eradication: Since the discovery of Hall scale in California, surveys have been made each year in suspect areas. State regulations concerning the movement of plant material have been effective in preventing spread of the pest. Eradicative measures used include host removal and 3 successive fumigations with hydrocyanic acid gas (HCN) under gastight tents.



The Current Situation: Since the last infestation was found in 1956, surveys have revealed no further infestations of Hall scale in Butte and Yolo Counties, California. In May 1958, inspections were made on locations in Arkansas, Florida, North Carolina, South Carolina, Tennessee, and Oklahoma, where host materials had been shipped from the infested area. Inspections also included the U. S. Plant Introduction Garden at Coconut Grove, Florida. Results were negative.

No further infestations were found in fiscal year 1959 when 72,144 host plants were inspected on 3,981 properties in 312 city blocks in the two counties in California that had been subject to Hall scale damage. It is expected that the program will be concluded by the end of 1960. Over a period of 19 years this program required the inspection of 1,046,748 hosts and the fumigation or destruction of 48,946.

Most Recent Department Informational Aids:

Publication: The Hall Scale Eradication Project, Circular No. 920, September 1953.

Slides: Series of 11 2x2 slides. Available for loan.

IMPORTED FIRE ANT

History: The imported fire ant (Solenopsis saevissima richteri), a native of South America, is believed to have entered this country with cargo through the Port of Mobile, Alabama, about 1918. Gradually it spread to an area adjacent to the city of Mobile and by 1940 infestation appeared in areas as far west as Mississippi and east to Florida. The spread continued and by 1957 it was reported in nine southern States. This pest has spread at an alarming rate by flying, crawling, drifting on logs, movement on crops or nursery stock, and by other carriers.

In the calendar year 1957, Congress authorized a joint Federal-State imported fire ant eradication program. On October 15, 1957, the Southern Plant Board—represented by the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, Tennessee, and Texas—met at Memphis, Tennessee, with representatives from the Agricultural Research Service to consider the most effective means of attacking the problem. The following objectives were established: (1) preventing further spread of the fire ant by application of regulatory procedures, (2) location and prompt eradication of outlying infestations, and (3) development of jointly-financed county or area-wide eradication programs in areas where infestation is general. The group urged the early adoption of a Federal quarantine.

First consideration was given to outlying areas of incipient or sporadic infestations. Within generally infested areas, progressive eradication programs are being undertaken on a county or parish basis and planned in such a way as to extend over a period of two or more years, depending upon the acreage involved and the availability of necessary funds and facilities. State fire ant advisory committees have been organized in most States involved in the program. Membership includes representatives from various segments of agriculture and conservation. Local committees likewise have been established in many counties and parishes undertaking eradication programs. These local committees are responsible for local participation, assist in the development of plans of operation, share responsibility in conducting the program, develop local publicity and contacts necessary to the orderly accomplishment of the work, and act as local clearing houses for information. The program is financed jointly by Federal, State and local agencies, and property owners.

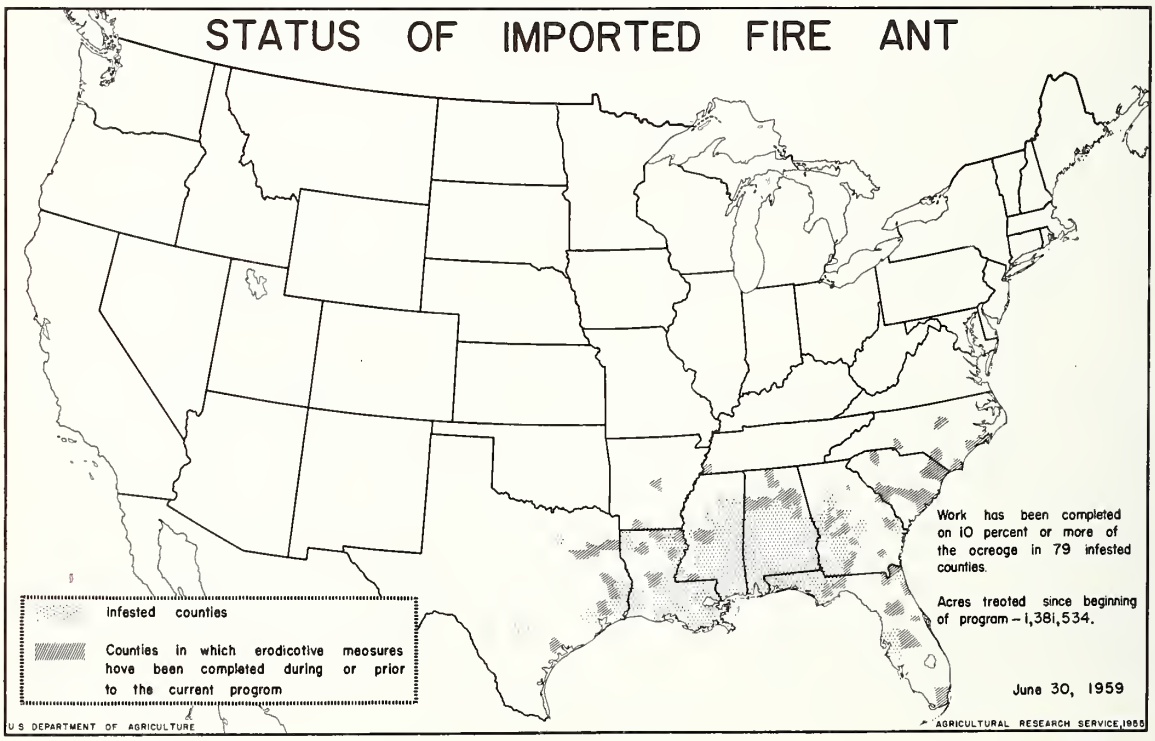
Nature of Pest: The imported fire ant is a destructive and annoying pest. It damages crops, attacks and injures young, unprotected animals, and birds, and its bite and painful sting are harmful to humans. It interferes with harvesting and other hand labor in fields of forage and cultivated crops and reduces the carrying capacity of pasture lands.

Imported fire ants may also attack the young of animals and birds—wild and domestic. They will enter pipped eggs of poultry and ground-nesting birds and attack the young as they emerge from the shell.

Although primarily a field or out-of-doors insect, the imported fire ant will invade houses. Its favorite foods are meats, butter, cheese, nuts, and bread.

The worker ant is 1/8 to 1/4 inch long and is blackish-red to reddish-brown, wingless, and usually sterile. The other two adult forms are the winged females or queens which lay eggs, and winged males which mate with the queens. An ant colony begins when the queen, after mating, digs an underground chamber and starts laying her eggs. This chamber is the start of the mound. The life cycle of the ant covers a period of 25 to 40 days, depending on conditions.

Eggs hatch into larvae in 8 to 12 days; larvae change to pupae in 6 to 12 days; adults emerge from pupae in 9 to 16 days. As many as 50 to 75 mounds or more per acre frequently occur. These mounds, normally about a foot high and two feet across, probably contain an average of 25,000 ants, and are most common in pastures, parks, lawns, meadows, and cultivated fields. Open, sunny sites in pastures or uncultivated areas and abandoned fields are preferred; however, cultivated fields also become infested.



Survey, Quarantine, and Eradication: Surveys are made by Federal and state workers to establish the infestation pattern. The eradication program is developed on the basis of the surveys.

Federal Quarantine 301.81, applicable to the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas, became effective May 6, 1958, with specified parts of these States included in the regulated area. The purpose is to prevent the spread of this pest from States where it is known to occur. Regulated articles include soil and articles contaminated therewith, forest products, and other infested commodities.

The Current Situation: By June 30, 1959, 1,381,534 acres had been treated in 9 Southern States under the cooperative eradication program and by individual property owners; 931,981 acres of this total were treated during the fiscal year 1959. Treatments have been completed in all known infestations in approximately 85 counties. All known infestations in North Carolina have been treated and all infestations in Arkansas and South Carolina are under treatment. Practically all commercial nurseries within the infested area have been soil treated. Eradication is accomplished with granular insecticides applied by airplane, mechanized ground equipment, or manual applicators. The treatments are applied only to areas where infestation exists.

Methods improvement work done at the Division's Gulfport, Mississippi, laboratory made possible a reduction in the eradication treatment dosage of granular insecticide from 2 pounds actual material per acre to $1\frac{1}{4}$ pounds during the fiscal year. Studies are continuing to determine if still lower dosages, probably with a split application, will be effective. Baits and lures are being tried in an effort to further increase the effectiveness and efficiency of this program.

Most Recent Department Informational Aids:

Publications:	The Imported Fire Ant - How to Control it, Leaflet No. 350, 1954.
	The Fight Against the Imported Fire Ant, Program Aid No. 368, August 1958.
Quarantine:	Federal.
Films:	Fire Ant on Trial, 28 minutes, 16 mm. Color, Sound
	The Imported Fire Ant, 13 minutes, 16 mm. Color, Sound
Slides:	Series of 32 2x2 slides with legends. November 1957. Available for loan.

JAPANESE BEETLE

History: The Japanese beetle (Popillia japonica) is of oriental origin and was brought to New Jersey with plants from Japan prior to 1916. It is now found in parts of coastal and adjacent States from Maine to Georgia, with some spotted infestations outside this area as far west as Iowa and Missouri.

Nature of Pest: The beetle lives in the soil as a grub for about 10 months. The adult, which emerges in early summer, is approximately one-half inch long, of a brilliant metallic green or bronze color with coppery-brown wing covers. The abdomen is marked by a row of white spots along the sides, with two prominent white spots near the tip. The female beetle deposits her eggs in the soil. Adults are most numerous in July and disappear by September.

The adult, which lives about 30 days, feeds on and skeletonizes the leaves of grapes, peaches, apples, berries, soybeans, ornamentals, and other plants. The root-feeding grub is responsible for extensive damage to turf in pastures, lawns, and golf courses. In all, this pest attacks more than 200 agricultural and ornamental plants, causing damage of around $10 million annually.

Survey, Quarantine, and Control: When firmly established within a community, control of the Japanese beetle by insecticides or biological control is a slow, difficult, and costly process. For this reason Federal-State regulatory and control programs are in effect to protect uninfested areas. In force since 1919, the Federal quarantine provides procedures for the interstate movement of commodities with a minimum of interference to regulated commerce and the public. The regulations now apply to 15 Northeastern States and the District of Columbia. Soil, balled and burlapped nursery stock, grass sod, plant crowns or roots, and bulbs are the chief carriers of larvae. Insecticide soil treatments, soaks, dips, and fumigation are used for destroying larvae. Adults may become "hitchhikers" in cars, trucks, reefer cars, and aircraft. Fumigation and aerosol treatment are used to disinfest transport facilities. A limited amount of control is done each year in support of the quarantine. The operation of this cooperative program under Federal leadership, combined with Federal and State research, seeks to provide better methods for controlling this pest.

The Current Situation: The infestation is general throughout the area outlined on the accompanying map. The program in the eastern part of the country involves principally regulatory activities aimed at prevention of the insect being transported to noninfested areas.

The Japanese beetle quarantine and administrative instructions, as revised effective December 8, 1958, bring the quarantine and regulations up to date and into uniformity with the other recently revised Federal domestic plant quarantines. The quarantine names in one group the specific articles which are to be regulated. A second group, "Class B," contains articles which will be regulated when found by the inspector to represent a hazard of spread of the beetle.

Provision is made in the quarantine to designate certain sections "suppressive areas" as separated from the "generally infested areas." This provision offers protection against reinfestation in areas which may be designated for suppression.

Increased emphasis has been placed on survey for the beetle outside the area under Federal regulation, with the objectives of discovering any additional areas that may need to be placed under State or Federal quarantine and of determining the need for control or eradication measures in certain areas. During the summer of 1958 the Plant Pest Control Division and the affected States conducted a Japanese beetle appraisal survey in Southern and Midwestern areas not regulated by Federal quarantine. It involved increased survey activities and special field observations in 14 States. It is estimated that there are now more than 1,300,000 acres of outlying Japanese beetle infestations.

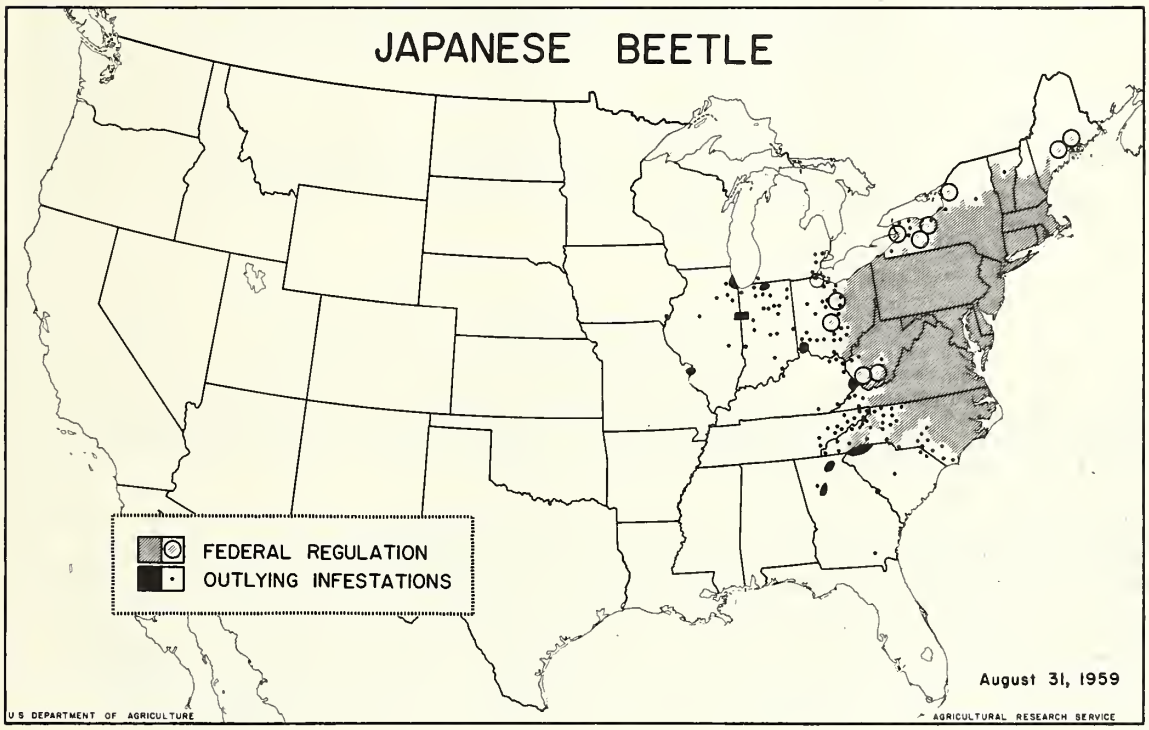
TRAPS IN USE, JUNE 1959

Central Region		Southern Region		Eastern Region		Western Region	
Illinois	4,869	Alabama	188	Virginia	200	Arizona	110
Indiana	2,023	Arkansas	50	West Virginia	158	Montana	24
Iowa	1,598	Florida	351	Total	358	Oregon	36
Kansas	50	Georgia	714			Washington	120
Kentucky	1,925	Louisiana	20			Total	290
Michigan	12,373	Mississippi	52				
Minnesota	565	North Carolina	456				
Missouri	3,234	Oklahoma	45				
Nebraska	67	South Carolina	624				
North Dakota	30	Tennessee	537				
Ohio	6,005	Texas	31				
Wisconsin	302	Total	3,068				
Total	33,041						

Grand Total 36,757

Corrected table for page 23 - Cooperative Plant Pest Control Programs, Fiscal Year 1959

PPC Division - 3-7-60



Reports indicate that Japanese beetle adult populations were generally heavier at the close of fiscal year 1959 than for the same period in 1958, especially in the lower Lake States. New infestations were reported outside of the area regulated by the Federal quarantine from Ohio, Illinois, Indiana, Tennessee, Michigan, and Missouri. During the year, soil treatments were applied on 26,831 acres and in addition 6,726 acres received suppressive foliage sprays.

Year-round regulation of soil and plants to prevent spread of the soil-inhabiting forms of Japanese beetle from quarantined areas to noninfested areas was checked by means of 23,328 calls to shippers and carriers who moved products.

Research to find ways to mass-produce viable milky spore disease organisms for control of the pest, especially in outlying areas, is underway at the Northern Utilization Research and Development Laboratory at Peoria, Illinois. The Entomology Research Division is supplying strains of the disease organism and conducting spore viability tests. Methods for aerial and ground dispersal of the material are being studied by the Plant Pest Control Division.

Most Recent Department Informational Aids:

Publication:	Controlling The Japanese Beetle, Farmers Bulletin No. 2004, March 1958. The Japanese Beetle...how we fight it, Plant Pest Control Division, January 1959
Quarantine:	Federal and State.
Film:	The Japanese Beetle (Color; released 1957, 13½ min.)
Slides:	Series of 15 2x2 slides with legends. February 1958. Available for loan.

KHAPRA BEETLE

History: The khapra beetle (Trogoderma granarium), first described in 1898, is a native of India, Ceylon, and Malaya where it is considered the most serious of all storage pests. It is now known to occur in England, Korea, Germany, Egypt, and other European, African, and Asiatic countries.

A khapra beetle-infested warehouse at Alpaugh, Tulare County, California, discovered November 10, 1953, was the first known occurrence of this insect in the Western Hemisphere; however, there is evidence that the beetle may have been present in a warehouse at Fresno, California, as early as 1946. Infested, used burlap bags transported from the Fresno warehouse to Alpaugh may account for this infestation. Khapra beetle was found infesting stored grain in Phoenix, Arizona, in January of 1954. In April of that year, specimens were recovered on sacked seed in New Mexico. The pest was also collected from a warehouse in Mexicali, Baja California, Mexico, in 1954. The pest was found in Texas in 1959.

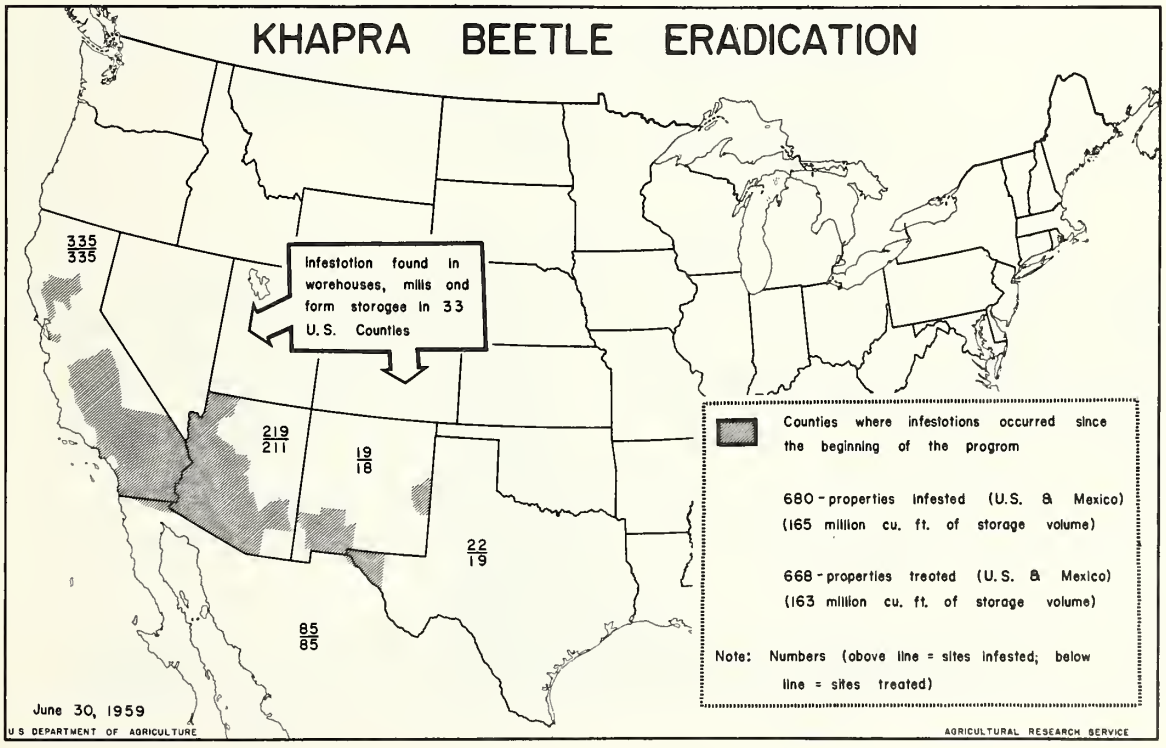
Nature of Pest: The newly-hatched larva is 1/25 inch long, with a yellowish-white body and brownish or yellowish-brown head. Upon development it assumes a reddish-brown appearance. The female pupa is about 1/4 inch in length, the male pupa is much smaller. The pupa is lighter in color than the larva. When the adult khapra beetle emerges from the pupa it remains within the last larval skin for a period varying from a few hours to 10 days or more according to the temperature. The adult is a small brownish-black beetle, oval-shaped, the female is about 1/8 inch long, and larger and lighter in color than the male.

The life cycle of the khapra beetle is completed in 35 to 100 days, depending on temperature. Temperatures from 85° to 90° F. are optimum, yet the larvae have been known to withstand temperatures of 14° F. for short periods of time, and the upper level is considered to be about 115° F. Adult females average about 50 eggs each but may exceed 100, at temperatures above 90° F. The adults live only a short time and apparently do not feed.

Grain damage, in established infestations normally varies from 5 to 30 percent but damage up to 75 percent has been reported. In this country khapra beetle damage has been found in oats, wheat, corn, beans, nuts, alfalfa seed, castor beans, cottonseed, and other food products. Preferred processed materials include cornmeal, rolled oats, flour, breakfast cereals, crackers, dog biscuits, powdered milk, raisins, and nut meats. Bulk grain under extended storage presents the most favorable conditions for beetle multiplication and subsequent damage.

Survey, Quarantine, and Eradication:

Detection of light infestations of khapra beetle is very difficult and may require repeated inspections. Dirty grain and dockage appear to encourage the pest to thrive and skyrocket in population. In bulk storage where heavy infestation occurs, the larvae tend to congregate in the surface grain and on or near the walls. Empty bins and warehouses, ledges, cracks in the floor or walls, and old cartons, rags, sacks, newspapers, scrap lumber, or other debris serve as likely places to find larvae. Because of the habit of the larvae of concealing themselves in crevices and cracks and living for extended periods without food, nothing short of a penetrating fumigant provides effective eradication. Methyl bromide is applied to structures covered with gastight tarpaulins. The fumigant is applied at the rate of 5 pounds per 1,000 cubic feet for an exposure period of 48 hours. Concentrations of the fumigation gas in the building must be maintained at 32 ounces, or above, for at least 24 hours of the exposure period.



The States of Arizona, California, New Mexico, and Texas are under Federal quarantine, the application of which is limited to infested properties. Grain, seed, bags and bagging, dried animal products, and other articles subject to infestation are regulated. Fumigation of shipments of infested commodities with methyl bromide permits safe movement.

The Current Situation: During the fiscal year ending June 30, 1959, 12,361 properties were given initial inspection and 30,995 sites were reinspected in 34 States and the Republic of Mexico. Of the sites inspected, 70 were found to be infested, and included buildings with a volume of 16,382,940 cubic feet. Seven of these properties involved reinfestations. Fumigation treatment was applied to 68 properties comprising 15,698,400 cubic feet.

The following table reflects the work accomplished since the initiation of the program in 1955:

	Infested		Treated		Remaining 7/1/59	
	No. Prop.	Cu. Ft.	No. Prop.	Cu. Ft.	No. Prop.	Cu. Ft.
Arizona	219	55,385,971	211	54,718,971	8	667,000
California	335	80,864,004	335	80,864,004	0	-
New Mexico	19	1,778,808	18	1,721,784	1	57,024
Texas	2	1,850,716	19	1,229,848	3	550,868
Rep. of Mexico	87	24,877,491	87	24,877,491	0	-
Total	682	164,756,990	670	163,482,098	12	1,274,892

Most Recent Department Informational Aids:

Publications: The Khapra Beetle—A Situation Report, ARS 22-17 August 1955.

Have You Seen This in Your Grain, PA-261, January 1955.

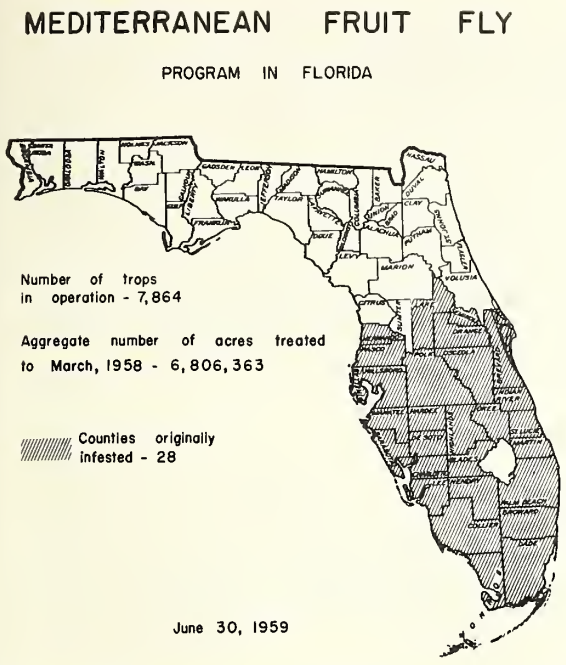
Film: Eradicating The Khapra Beetle, (Color, September 1957, 13-1/2 minutes.)

Slides: Series of 18 2x2 slides with legends, December 1957. Available for loan.

MEDITERRANEAN FRUIT FLY

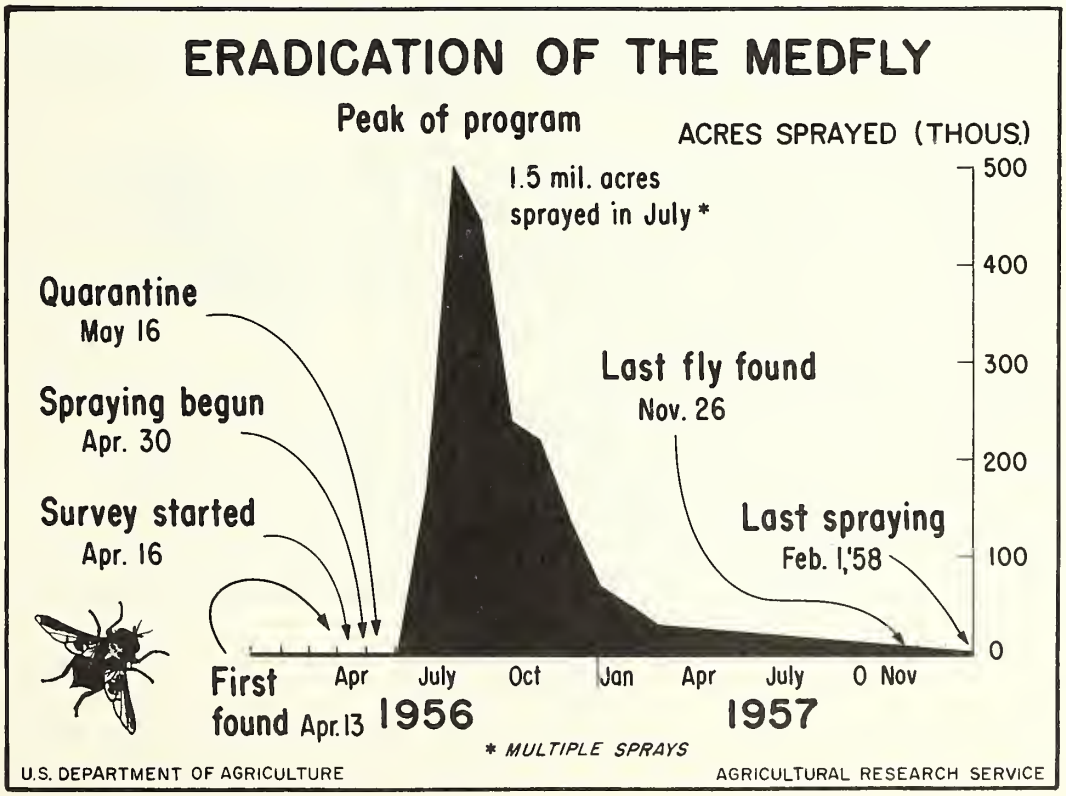
History: The Mediterranean fruit fly (Ceratitis capitata) is a native of the Mediterranean area. It has been reported in Europe, Asia, Africa, South America, Central America, and the State of Florida in the United States. The first infestation in the United States was found in Florida in 1929 and involved 20 counties in the central part of the State. It was eradicated by the latter part of 1930, at a cost of about $7,500,000. It did not become established again in the United States until April 13, 1956, when it was found at Miami Shores, Florida. This latter infestation was eradicated by late 1957. The importance of this pest is indicated by its record in other countries. In Greece, as much as half of the citrus crop has been lost in some years. In Sardinia in 1950, 30 percent of the peach crop was lost and apple, pear, and orange crops were seriously damaged. In areas of Africa and South America, the pest has made commercial fruit production difficult, if not impossible.

Nature of Pest: In Florida the Mediterranean fruit fly is capable of producing about 10 generations a year. It has four life stages—adult (fly), egg, larva, and pupa. The adult is a little smaller than a housefly. Its body is yellow, tinged with brown; it usually lives 30 to 60 days and is a strong flier.



The female adult pierces the skin of a host fruit with her needlelike ovipositor and then deposits up to 10 eggs in the puncture. This same egg puncture may be used by other Mediterranean fruit flies; several hundred eggs have been found in a single cavity. When conditions are favorable, female flies probably lay an average of about 300 eggs during a lifetime. The eggs hatch into larvae in 2 or 3 days. When mature, the larva leaves and enters the soil by dropping to the ground. Frequently the fruit has dropped to the ground by the time the larva is mature. In the soil it rapidly passes through the pupa stage and emerges from the soil as a fly in 8 to 14 days. In about 7 to 9 days after emergence the flies mate.

Survey, Quarantine, and Eradication: The intensive trapping program in operation at the termination of the treatment program was continued at a high level in Florida during the summer of 1958. Trap numbers were reduced during the winter of 1958-1959. A comprehensive trapping program is being continued to detect any new invasions that may occur. The States of Alabama,



Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas are working in close cooperation on this detection program. All plastic traps now in use have been converted to combination traps capable of attracting five species of fruit flies. Similar combination traps are also being extensively used as a detection measure in certain of the citrus-producing areas of Arizona and California.

The Current Situation: The detection trapping program in operation on June 30, 1959, involved the use of 8,236 traps. Of this total, 56 were in operation in Alabama, 27 in Georgia, 106 in Louisiana, 63 in Mississippi, 85 in South Carolina, 35 in Texas, and 7,864 in Florida. Adjustments were gradually made in trapping operations so that by the end of the fiscal year traps were being operated principally around possible points of entry, such as military and civilian airports, cargo ship docks, ports used by large pleasure craft and shrimp boats, and other similar areas.

Most Recent Department Informational Aids:

Publication:	The Mediterranean Fruit Fly, PA No. 301, December 1956.
Quarantine:	Federal and State.
Slides:	Series of 32 2x2 slides. Available for loan.
Film:	The Rise and Fall of the Medfly, 1958. (Color, 15½ min.)

MEXICAN FRUIT FLY

History: The Mexican fruit fly (Anastrepha ludens), a native of northeastern Mexico, appeared in southern Texas in 1927. In 1954, fruit flies were trapped at intervals from January to November in northern Baja California, Mexico. Records indicate that the shipment of infested fruit into Mexican fruit-fly-free areas can serve as a source of new infestations.

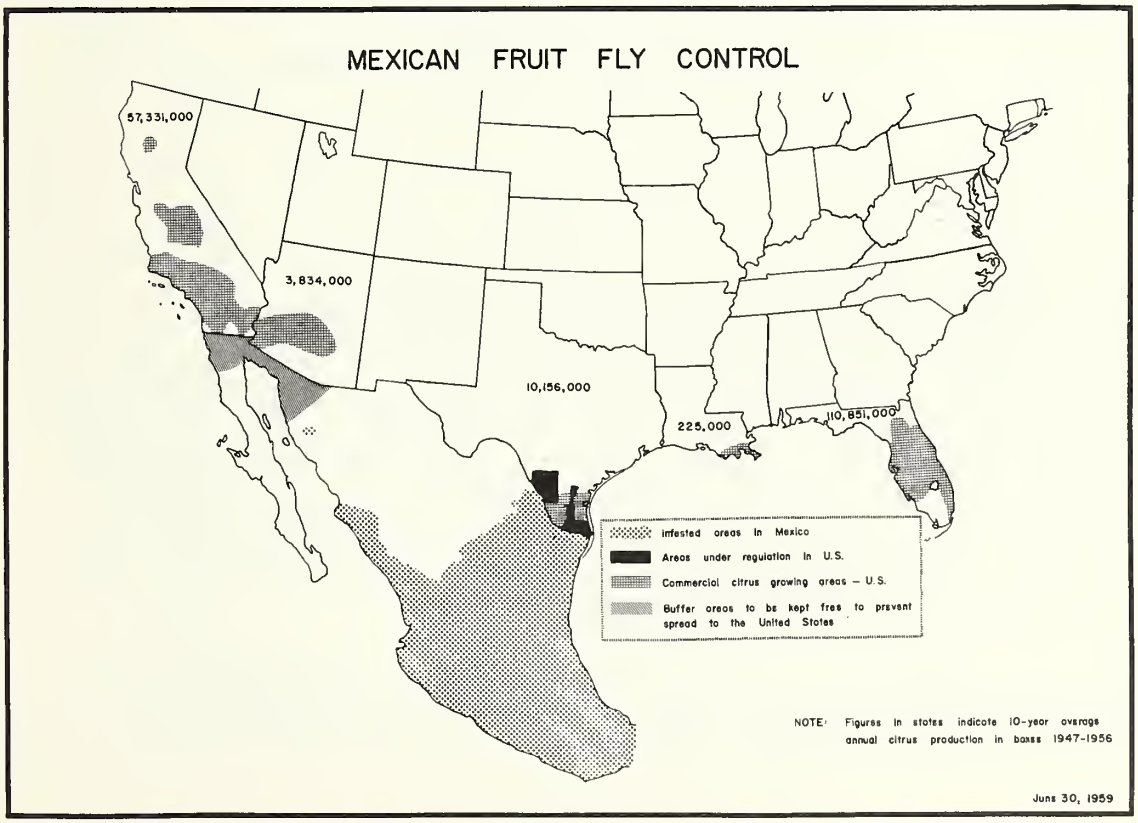
Nature of Pest: The Mexican fruit fly attacks citrus and a variety of other fruits. The female pierces the rind of the fruit and lays numerous eggs beneath. After the eggs hatch, the larvae feed within the fruit until the fruit falls to the ground. When full-grown, the larvae leave the fruit and enter the ground to pupate. Emergence of the pest in the adult stage soon follows. Three to five generations may occur in a year. The Mexican fruit fly apparently does not survive the summers in the Texas citrus areas but migrates from Mexico each fall and infests citrus fruits, particularly grapefruit, in the lower Rio Grande Valley. Infestations vary greatly from year to year.

Survey, Quarantine, and Control: The purpose of the survey is to detect the fly if present and to delimit the infestation. Traps are used to detect the presence of adult flies in the orchards and to measure extent of population. Grove inspections are made to locate larval infestations. The State of Texas is quarantined on account of the Mexican fruit fly but the requirements of the quarantine are limited in application to the south Texas Counties of Brooks, Cameron, Dimmit, Hidalgo, La Salle, Webb, Willacy, and part of Jim Wells. The treatment and certification requirements for host fruits are seasonally adjusted to permit, so far as possible, free and safe movement of fruit to market and protection to other citrus areas. Fumigation and vapor heat treatments have been approved as a basis for certification.

The control program has three objectives: (1) Enforcement of Federal Quarantine No. 64 to prevent the spread of the pest from the infested area in southern Texas to other fruit-growing sections; (2) cooperation in California and northwestern Mexico in a campaign to eradicate the light infestation near the international border; and (3) cooperation with the Mexican Defensa Agricola in enforcement of the Mexican quarantine in the northern part of Baja California and Sonora. There, the Plant Pest Control Division is cooperating in the following phases of the program: Enforcement of quarantine regulations, inspection of groves, trapping for detecting infestations, and treatment of infested fruit moving from the regulated areas.

The pest has spread over the Republic of Mexico. Current losses to citrus and mango fruit growers of eastern Mexico are estimated at 8 to 38 percent of the crops. No economic losses to the fruit industry have occurred in Baja California, Mexico, or the States of California and Arizona, U.S.A. Although fruit flies have been trapped in these areas, infestations have not been permitted to become established. Fruit losses in Texas attributable to this fly have been very low in recent years.

The Current Situation: A review of the 1958-59 Texas records revealed that first infestations, both adult and larval, were discovered unusually late in the season. While two adult fruit flies were trapped fairly early in the season, it was March before any other specimens were taken, and no fruit flies were trapped after the first week in May. The very light fruit crops of the wild host in Mexico, yellow chapote (Sargentia greggii), possibly is the reason why infestations were lighter and later than usual in Texas orchards. Compliance with the new Mexican Fruit Fly Quarantine (revised 1957) was most satisfactory again this year, with no violations detected.



In the Republic of Mexico, surveys and inspections indicate the program objective of preventing reinfestation and establishment of an incipient infestation of the Mexican fruit fly in northern Baja California was achieved for another year. This was accomplished through a seasonal eradication spray program, coupled with regular inspections of the fruit markets in the principal cities, and the maintenance of strategically located inspection stations for the purpose of intercepting and destroying or treating by fumigation all host fruits transported from the infested areas. The protective spray program was maintained from July 1 to October 20, 1958, and from May 12, 1959, to the end of the fiscal year. Spray applications were made at 21-day intervals with a formulation of 8 pounds of 25 percent wettable malathion and 2 pounds of SIB #7 used as an attractant per 100 gallons of water.

With the exception of a precautionary spray program administered by the State in southern California areas during periods when flies might be present, the program in Arizona and California consists of intensive fruit inspection, trapping, and some fumigation of hosts fruits.

In June 1959, under the cooperative program with Mexico, a total of 1,902 traps were in operation on 860 properties at Tecate, Tijuana, and Ensenada. Visual inspections also constitute a segment of this cooperative program. As a protective measure, sprays were applied to more than 192,631 host plants on the infested properties and the environs. This cooperative effort of the Mexican Defensa Agricola and State and Federal authorities in the United States apparently has stopped the northward spread of the Mexican fruit fly and obviated the need for costly eradication programs in Arizona and California.

Most Recent Department Informational Aids:

Publication:	The Mexican Fruit Fly—How We Fight It, PA 265, July 1955.
Quarantine:	Federal and State.
Slides:	Series of 20 2x2 slides with legends, November 1957. Available for loan.

MORMON CRICKET

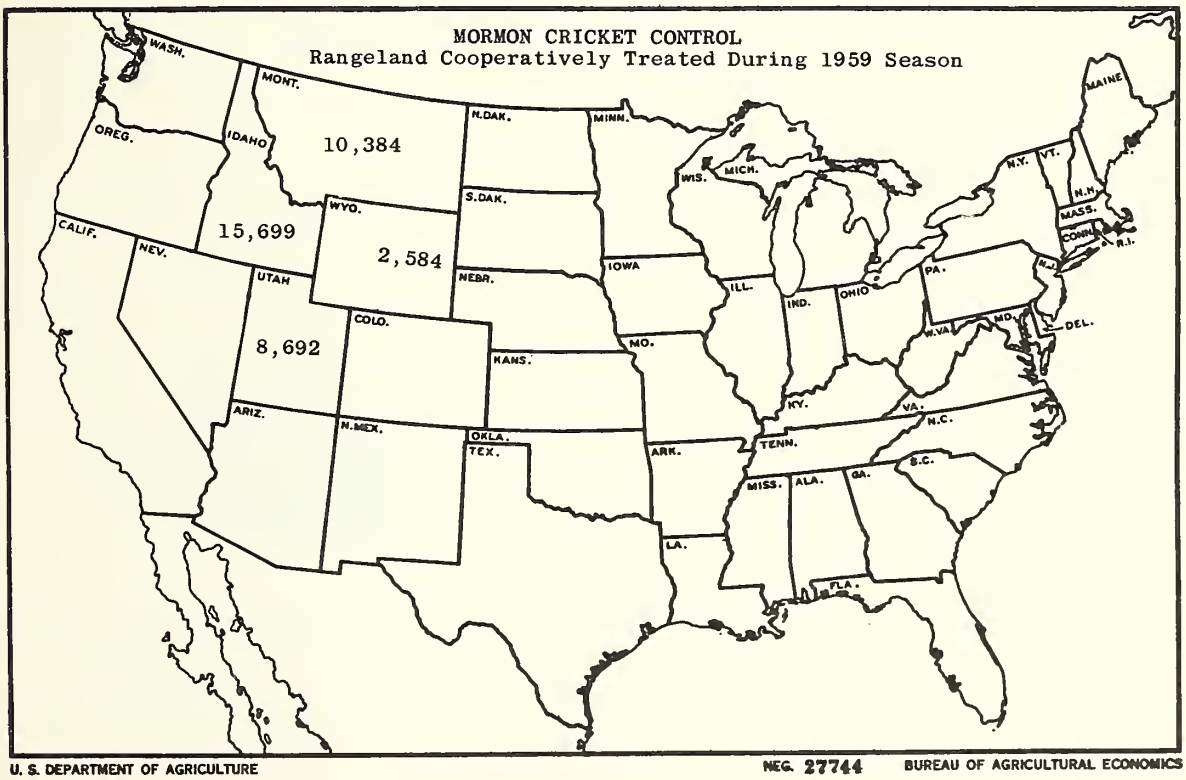
History: Since the days of the early settlers the Mormon cricket, a large, wingless, long-horned grasshopper, has remained a periodic pest and threat to agriculture. The range of the Mormon cricket extends from the Missouri River westward to the Cascade and Sierra Nevada Ranges and from the Canadian border to northern Arizona. During the 1930's Mormon crickets reached the largest outbreak proportions on record. A survey in the fall of 1938 revealed damaging populations in Colorado, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. Nevada, Montana, Wyoming, and Idaho have had the most widespread outbreaks. While it is less destructive than many other insects, the suddenness and severity of its attack on range and cultivated crops and the overwhelming numbers in the attacking bands make it one of the most spectacular of all insects. The greatest damage is to range forage. It feeds on more than 250 species of range plants and on all cultivated crops growing in the area where it occurs. The destruction of seed on forage and browse plants adversely affects the establishment or maintenance of range cover.

Nature of Pest: The Mormon cricket maintains itself in permanent breeding areas located in and around mountain ranges of the West such as the Big Horn Mountains in Wyoming, the Pryor Mountains in south-central Montana, and the Ruby and Independence Mountains in Nevada. When populations have increased to a high

concentration, the crickets leave these breeding areas and infest adjacent range and farmlands. Usually two or three years are required for an outbreak to develop. Mormon cricket eggs are normally laid just below the soil surface in midsummer. By the time the ground freezes, the young crickets are partially developed within the eggs but do not hatch until the ground warms in the spring. Hatching normally starts about April 1. The nymphs pass through seven stages of growth, each separated by molts. They become adults in about 60 days. About 100 days after becoming adults, the crickets mate, and the females start ovipositing. One female may oviposit as many as 250 eggs, although the average number is probably near 150. A light, sandy-loam soil in a well-drained location is usually chosen for ovipositing, preferably on a southern, eastern, or western slope. Unlike grasshopper eggs, which are deposited in a pod, cricket eggs are laid singly. Often as many as 100 are found closely grouped.

Mass migration is a characteristic of an outbreak of Mormon crickets. By the time the crickets have molted four or five times the migrations have become general, and the converging bands may cover hundreds of acres. On the basis of 50 favorable days from the time migration starts until ovipositing begins, a band may travel 25 to 50 miles in a single season.

Survey and Control: It is desirable that all individuals interested in Mormon cricket control be organized to report impending outbreaks and to prevent infestations from reaching outbreak proportions by controlling them at their source. Measures to control Mormon crickets have evolved through progressive stages as rapidly as research has led the way. Early operations to halt migrating bands involved the use of trench barriers, wood or metal barriers, oil on water barriers, and dusting the insect with sodium arsenite dust.



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In the late 1930's effective baits were discovered. Several formulations were tried until the present rolled-wheat bait was developed. It is applied by ground spreaders and by airplanes in the path of migrating bands. It is preferable to spread the bait when the crickets are migrating. Under such circumstances the crickets feed immediately, and the results will be evident in 24 hours or less. If the bait is spread while the crickets are inactive, control is often delayed and often ineffective. During the period 1937-1949, more than 673,000 acres of cropland in the Rocky Mountain region were damaged by the Mormon cricket. Most of this damage was done before 1942, prior to the extensive use of bait treatment now used in control campaigns.

The Current Situation: A total of approximately 37,209 acres were baited under the cooperative Mormon cricket control program during the 1959 crop season. Acreages and areas in the program included 15,699 acres in several western Idaho counties; 10,384 acres in the Fort Belknap Indian Reservation, Montana; 8,692 acres in Daggett, San Juan, and Washington Counties, Utah; and 2,584 acres in Natrona County, Wyoming. Surveys in four counties in the State of Oregon revealed only scattered infestation. It is believed that Mormon cricket infestations of economic importance within the State of Oregon did not exceed 500 acres. Surveys in eight northern Nevada counties revealed small scattered infestations, some of which were heavy in spots and have the possibility of developing into threatening infestations by next year. No large-scale control program was necessary in Nevada this year as populations did not develop as anticipated.

Most Recent Department Informational Aids:

Publication: Mormon Crickets—How to Control Them, Farmers Bulletin No. 2081, July 1955.

Slides: Series of 5 2x2 slides. Available for loan.

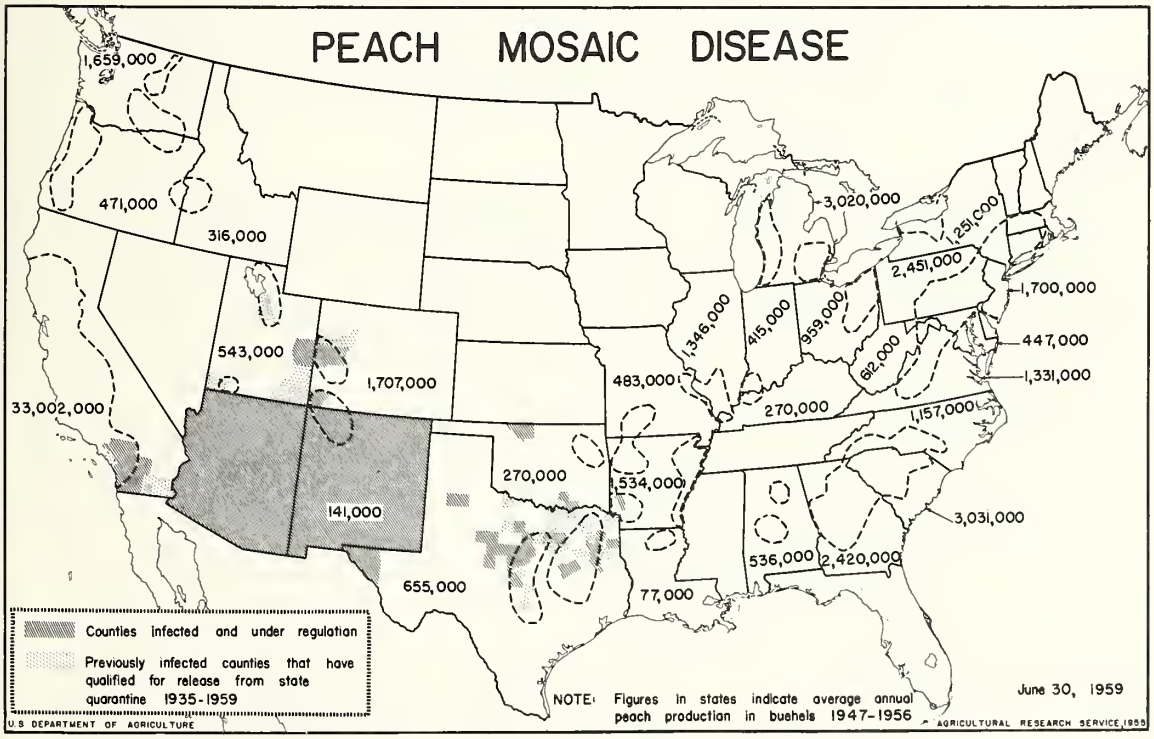
PEACH MOSAIC DISEASE

History: Peach mosaic is a serious disease of peaches and affects almond, apricot, nectarine, and plum. It was first observed in the United States in Texas in 1931 and is now known to be present in the States of Arizona, Arkansas, California, Colorado, New Mexico, Oklahoma, Utah, and Texas.

Nature of Disease: The disease is caused by a virus transmitted from diseased to healthy trees by a microscopic eriophyid mite (Eriophyes insidiosus). In the spring, newly-formed leaves on affected trees become mottled and short internodes develop, causing profuse branching. The surface of the fruit in many varieties becomes irregular and bumpy, without control the disease may ruin a commericial orchard within a period of 3 to 6 years.

Survey, Quarantine, and Control: The objectives of this program are to: (1) Prevent further spread of the disease by adequate nursery and budwood inspection and uniform state quarantine enforcement, (2) assist growers in reducing the incidence of the disease in infected commercial orchards by yearly inspection, and (3) conduct detection surveys for the disease in areas where it is not known to occur. The States, the Federal Government, and industry cooperate in this program. Control is effected by the prompt removal of infected trees.

There has been a reduction in peach mosaic incidence over the total area. Quarantine enforcement to date has prevented the establishment of new areas of infection which would have developed had the shipment of infected nursery stock and budwood been permitted. The control activity is considered as a holding action and will continue as such until improved techniques are developed. The development of a control for the mite vector is an important need.



Research on control of the peach mosaic vector is being done by the Entomology Research Division, Agricultural Research Service, Riverside, California. Phytopathological studies are being carried on by the Crops Research Division, Agricultural Research Service, also at Riverside, California. State research agencies in affected areas are cooperating. These studies include testing tolerant or resistant peach varieties for the several known strains of the peach mosaic virus.

The Current Situation: During the fiscal year 1959, inspection was made of 2,494,646 trees, of which 1,462 were found infected with peach mosaic. It is believed that this low incidence of peach mosaic infection now present has resulted from the intensive survey and tree removal program. This condition offers a most favorable environment in which to approach the control of the insect vector of the disease.

Most Recent Department Informational Aids:

Publication:	Peach Mosaic, How We Fight It, PA 336, November 1957.
Quarantine:	State.
Slides:	Series of 15 2x2 slides with legends, April 1958 Available for loan.

PHONY PEACH DISEASE

History: Phony peach disease was first observed at Marshallville, Georgia, about 1885. The disease is thought to be native to the United States. It now occurs in 12 States located east of and including Texas, and is serious or potentially serious only where the range of the insect vectors overlaps areas of peach production. It is considered a serious threat to commercial peach production in Alabama, Georgia, South Carolina, and in the southeastern parts of Arkansas and Missouri, eastern Texas, and northern Louisiana.

The objectives of the phony peach disease program are to prevent the spread of the disease into uninfected areas and to obtain eradication of infested host plants. This is accomplished through: (1) Assisting the grower by inspecting orchards to identify infected trees that must be removed in order to prevent their serving as focal points of infection for phony disease-free trees within the area, and (2) inspecting wild and cultivated hosts to define areas of infection in order that eradicative measures may also be taken to prevent these serving as sources of infection. Since 1929 more than three million phony-diseased trees have been eradicated by growers, as well as many wild and other cultivated host plants.

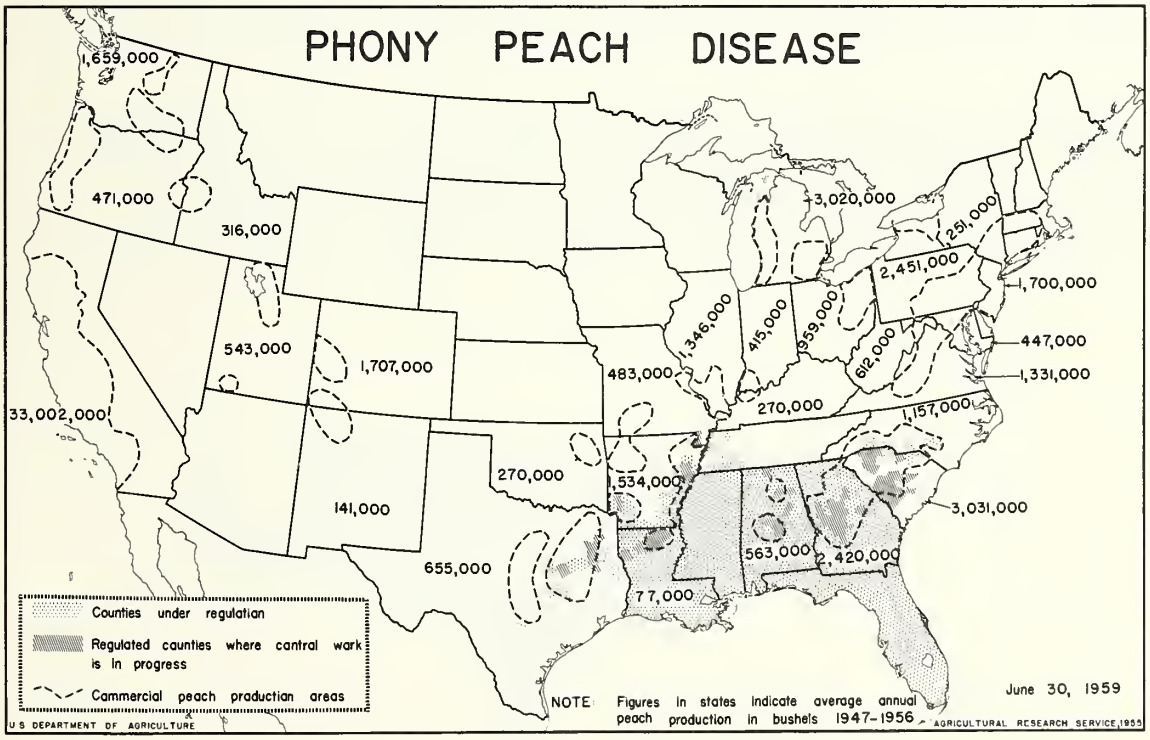
Nature of Disease: Phony peach disease is caused by a virus which is known to be transmitted by several species of leafhoppers, however, Homolodisca triquetra appears to be much more important in disease transmission than the others. The disease affects not only peach but apricot, almond, nectarine, and plum. Trees are not killed outright but the fruit becomes progressively smaller each year until production becomes unprofitable. The disease may affect a tree for 18 months before detection is possible; therefore, it is likely that some spread occurs before the diseased trees can be recognized and removed. Discovery that the disease is endemic in wild plums has led to efforts to eliminate plums in the vicinity of peach orchards as an aid to control.

Survey, Quarantine, and Control: In the phony peach disease control area, inspections usually begin after fruit is picked, and continue through September or October. Surveys are made primarily to reveal the status of the disease in the

the locality. Diagnosis is based on visual symptoms, although in cases of doubt, a chemical test using a solution of methyl alcohol and hydrochloric acid may be made to reveal the disease in the roots of the suspected trees. In the visual inspection of orchards, inspectors either walk the orchards, or ride in jeeps, and identification is based on a combination of factors including (1) short terminal growth which tends to give the tree a compact appearance with a rather even outline when viewed against the sky, (2) shortened internodes, and (3) flat, dark green leaves.

A Federal quarantine regulating the movement of peach nursery stock was in effect from 1929 to 1934. Regulation has continued from 1934 under uniform state quarantine established by the infested States.

The Current Situation: No inspections for phony peach disease were made in Illinois and Kentucky during the fiscal year of 1959. Inspection in Missouri revealed one phony-diseased tree on each of two properties, of the 31 properties and 41,117 trees inspected. A total of 17 diseased trees distributed over 4 counties in Illinois were destroyed in fiscal year 1957. Kentucky has had no phony peach disease reported since 1939. Field data for the fiscal year 1959 reveals a reduction in the number of phony-diseased trees in 6 States of the Division's Southern Region. In Georgia, the reduction was appreciable. Inspection activity during the fiscal year 1959 involved 3,400 properties and 6,338,974 trees. Only 15,989 phony peach-diseased trees were found, on 627 infested properties. Nurserymen are cooperating in an excellent manner with the nursery certification procedures. At the same time, peach growers continue to cooperate by furnishing labor and materials for the various operations connected with the work.



Most Recent Department Informational Aids:

Publication: Phony Disease of Peaches, Program Aid 255, May 1953.

Slides: Series of 11 2x2 slides with legends, January 1958. Available for loan.

PINK BOLLWORM

History: Pink bollworm (Pectinophora gossypiella), an insect native to India, was introduced from Egypt into Mexico in 1911. The first infestation in the United States was found at Hearne, Texas in 1917, probably introduced on shipments of infested cottonseed from Mexico. The insect now occurs throughout the cotton-producing areas of Texas, Oklahoma, and New Mexico, and in parts of Arizona, Arkansas, and Louisiana.

Nature of Pest: The adults of the pink bollworm are small, grayish-brown moths. Each female lays 100 to 200 eggs on cotton plants near the base of the squares or bolls. Eggs of the first generation are laid on squares and the larva feeds in the square and is fully grown by the time the bloom appears. Green bolls are preferred for egg-laying and feeding. The eggs hatch in 4-5 days, and the small, pinkish-white larvae then feed for 10-14 days. The life cycle in the summertime requires 25-30 days for completion. Most of the larvae overwinter in crop residue left in the fields after picking terminates. The adults do not harm cotton plants but are a cause of spread of infestation as they are carried long distances by wind.

As the pink bollworm larva feeds inside the green cotton boll, it moves from seed to seed, cutting and staining the immature fibers and eating out the seed contents. This results in low viability and loss of weight of the seed, and reduces the amount and value of the oil. Lint from damaged bolls is stained, short, and of low grade. Molds often completely ruin bolls in which pink bollworms have left exit holes. The pink bollworm also attacks okra and a number of other malvaceous plants.

Survey, Quarantine, and Control: The objectives of the pink bollworm control program in the United States and Mexico are eradication of isolated infestations and suppression of infestations in areas where eradication is not practicable, thereby preventing or retarding spread by moth flights. Overall program operations to meet these objectives involve: (1) Annual surveys throughout the cotton belt to locate new infestations as a basis for regulatory and control action; (2) enforcement of regulations to prevent spread; (3) cooperative Federal-State operation of

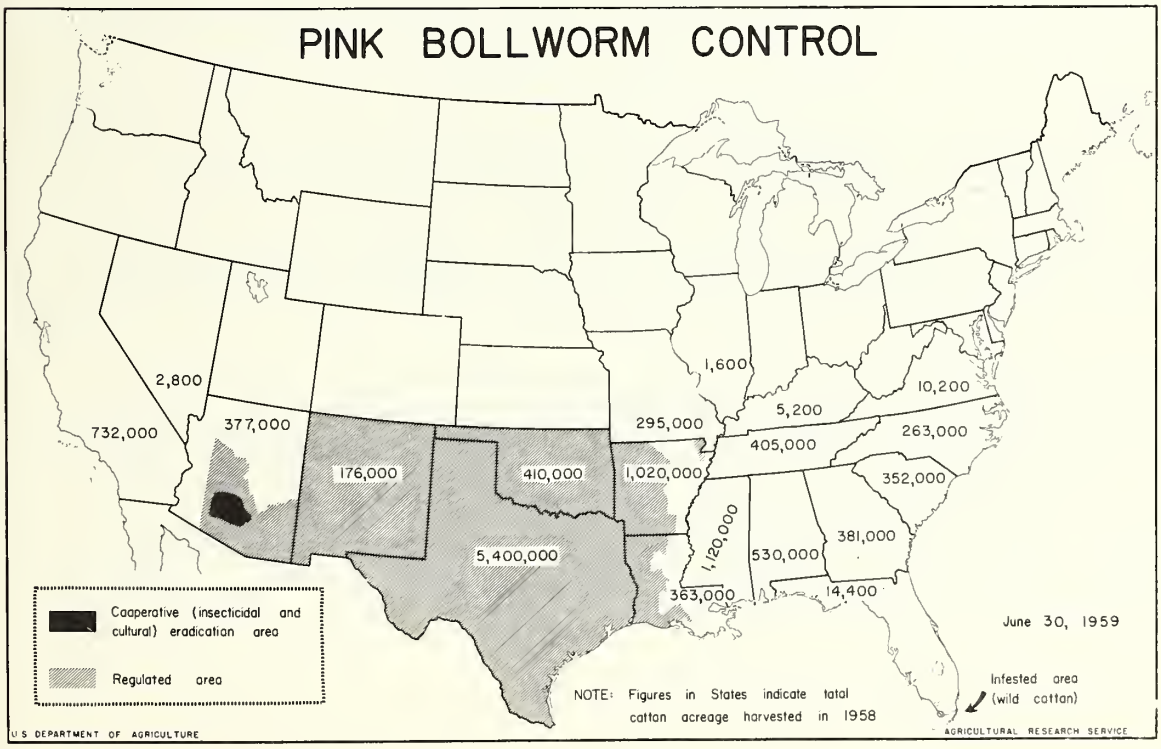
traffic inspection stations to prevent artificial dissemination of live pink bollworms; (4) aggressive suppression programs to prevent natural spread of the pest; and (5) elimination of outlying infestations along the peripheral boundaries of the generally infested area by observing strict cultural practices, supported by the timely applications of insecticides.

Several survey techniques are used in this program, including bloom, green boll, debris, gin trash, lint cleaner, and the use of light trap.

Cotton-growing states from Arizona to Arkansas and Louisiana, inclusive, are quarantined because of the pink bollworm. In the States of Arizona, Arkansas, and Louisiana the quarantine requirements are applied only to the infested and contiguous parts. Regulated articles include okra and kenaf, seed cotton, cotton lint and linters, cotton waste, gin trash, cotton seed and hulls, cottonseed cake and meal, used bagging and wrappers, used cotton harvesting equipment, and any other harzardous items. Unless exempt, regulated products and things require certification for interstate movement.

The Division cooperates with the Entomology Research and Agricultural Engineering Research Divisions of ARS; state regulatory officials; extension service; national, State, and local trade groups; pink bollworm committees; growers and processors of cotton, the Mexican Defensa Agricola, and trade groups.

Wild Cotton: The discovery of the pink bollworm in wild cotton and in ornamental plantings in southern Florida in 1932 added another threat to commercial cotton production. Although cotton is not grown commercially in this area, it is believed that the infestations in the wild and ornamental host were the source of the infestations discovered in northern Florida and southern Georgia. Rigid



quarantine regulations are in effect to prevent reinfestations of these and other areas of commercial cotton production.

Originally, infestations of pink bollworm were heavy in wild cotton and ornamental plantings on the mainland in Dade and Monroe Counties, Florida, and in the outlying keys. To help rid this area of pink bollworm, systematic destruction of wild and ornamental plants has been under way since 1932. This program reduced the infestation of pink bollworm to a very low level, with the subsequent danger of migration correspondingly low. When the operation was curtailed in 1947 and 1948, populations of pink bollworm again built up to dangerous levels in some of the keys. By 1949 many infestations had reached a 70 percent level. More recently, due to the gradual reduction of wild and domestic host plants over a period of years, as well as the establishment of non-cotton zones within the general area, pink bollworm populations in Florida have been kept at a very low point. Only one isolated area on the Florida Keys, in Monroe County, is now known to be infested with pink bollworm. This was indicated in surveys during fiscal year 1959 when a total of 85,917 fruiting wild cotton, hibiscus, and okra plants were inspected for the pest, and only 87 pink bollworm larval specimens were found in nine infestations. The year's inspection activity involved 14,802 acres distributed across 11 southern Florida counties.

The Current Situation: The pink bollworm is a matter of concern to cotton growers and processors from coast to coast. It now infests to some degree fully a third of the acreage devoted to cotton production in the United States. During the year the range of this insect was extended to several new counties in Arkansas and Louisiana and was found in Maricopa and Pinal Counties in central Arizona for the first time since 1947. Federal and State quarantines were extended to the new areas to prevent further spread. Following the rediscovery of the pink bollworm in Maricopa and Pinal Counties, Arizona, in the calendar year of 1958, prompt action was taken by Federal and State agencies and industry to inaugurate an eradication program using insecticide treatments and cultural measures. Insecticide application in Arizona began May 15, 1959, and was concluded July 14. The work involved the treatment of 75,000 acres. Infestation centers and a protective border were treated at six-day intervals until eight treatments had been applied. Dusts and sprays were used with equal effectiveness. The work was done by commercial operators under contract with the State of Arizona. Approximately 70 aircraft were used at the peak period in this operation.

The results of this work in Arizona is encouraging. Growers and industry provided one-fourth of the money to finance the work, the State of Arizona one-fourth, and the U. S. Department of Agriculture the balance. State and Federal Research agencies and industry representatives worked together to meet operational and technical problems. While the infested and protective zone acreage for treatment approximated 75,000 acres, by the close of the fiscal year when the seventh application had been started an aggregate of about 419,032 acres had been treated in the State of Arizona. On June 30, a total of 117 light traps were in operation in the cotton-growing areas of the State.

The Defensa Agricola of Mexico and the Plant Pest Control Division of the United States Department of Agriculture cooperate in the pink bollworm control program. During the year the area of activity in Mexico was principally confined to the five regulated States of Tamaulipas, Nuevo Leon, Coahuila, Durango, and Chihuahua and the States of Baja California, Sonora, and Sinaloa forming a protective zone. In the five regulated States of Mexico, debris and bloom inspection indicated an increase in infestation but not sufficiently heavy to inflict economic damage, except in Durango and southwestern Coahuila and possibly one area in Nuevo Laredo, Tamaulipas. Surveys indicate freedom from pink bollworm in the northwest protective zone and possible eradication in the Culiacan Sinaloa, district, where pink bollworm was found in one small isolated field in 1957.

The cooperative program with Mexico in establishing a protective zone in the border States of northern Mexico is playing an important role in the suppressive efforts in Texas. Populations of pink bollworm have been held at an extremely low level in these Mexican States and this has reduced materially the danger of migration to the north from this area.

Most Recent Department Informational Aids:

Publication: The Pink Bollworm, How We Fight It, Leaflet No. 339, 1953.

Quarantine: Federal and State.

Slides: Series of 15 2x2 slides with legends. June 1958. Available for loan.

PLANT PEST SURVEY

History: The survey program to determine the abundance of insects and related pests of economic importance was organized on its present basis in 1952. The program is national in scope, founded on cooperation with the agricultural agencies in the States. In addition to general insect survey operations, the control and regulatory programs of the Plant Pest Control Division are given special attention.

The Insect Pest Survey, which preceded the present program, was organized in 1921, by a group of entomologists volunteering to contribute information on incidence of insect pests, in the United States. The information obtained was compiled and issued at monthly intervals. In 1950, the Civil Defense Administration asked the United States Department of Agriculture to use its facilities to combat possible intentional introduction of insects, and diseases of livestock, crops, and forests. The following year, the Bureau of Entomology and Plant Quarantine discussed with various state agricultural agencies the advisability of setting up a "clearing house," for screening insect specimens and reports in each State, and making information available to the Bureau for a weekly national report. This widespread affirmative interest led to the development of the present cooperative survey organization with the States. Some of the State programs are organized entirely on a voluntary basis; others employ a survey entomologist who is jointly paid by the State and the Division. Jointly financed programs are in effect in 27 States.

During 1959 a stepped-up detection program was launched and incorporated within the existing cooperative plant pest survey. Plans are rapidly being made to implement this work through strengthening of identification services and increasing emphasis on the importance of the detection phase of plant pest control and eradication.

Objectives: Through cooperation of Division officials and various State and Agricultural Research Service agencies, plans and procedures are formulated for the nation-wide collection, reporting, and forecasting of insect abundance. Included are operational surveys essential to plant pest control and regulatory programs. Information on economic insects is also obtained to: (1) Assist farmers to more adequately protect their crops from insect attack, (2) supply current information on insect activity to agricultural workers, (3) aid and assure prompt detection of newly introduced insects, assisted by informative, illustrated releases published in the Cooperative Economic Insect Report, (4) develop a workable insect pest-forecasting service, (5) determine losses by insects, (6) aid in determining where insecticide supplies and equipment are needed, (7) develop

nationwide uniformity in reporting insect conditions, (8) maintain records on occurrence of domestic and foreign economic insects, and (9) provide a nationwide organization for biological warfare defense as it relates to insects.

Operational Procedures: Economic insect information for release in the weekly "Cooperative Economic Insect Report" is submitted through the state clearing houses by various cooperators and collaborators in entomology and related agricultural fields. Included are such agencies as extension services, experiment stations, state regulatory offices, Plant Pest Control Division, other related Federal agencies, and interested commercial organizations.

Field entomologists and agricultural workers collect and forward insect specimens to the clearing houses, or to the Division, where prompt identifications are made through cooperation with the Federal taxonomists of the Entomology Research Division and the United States National Museum.

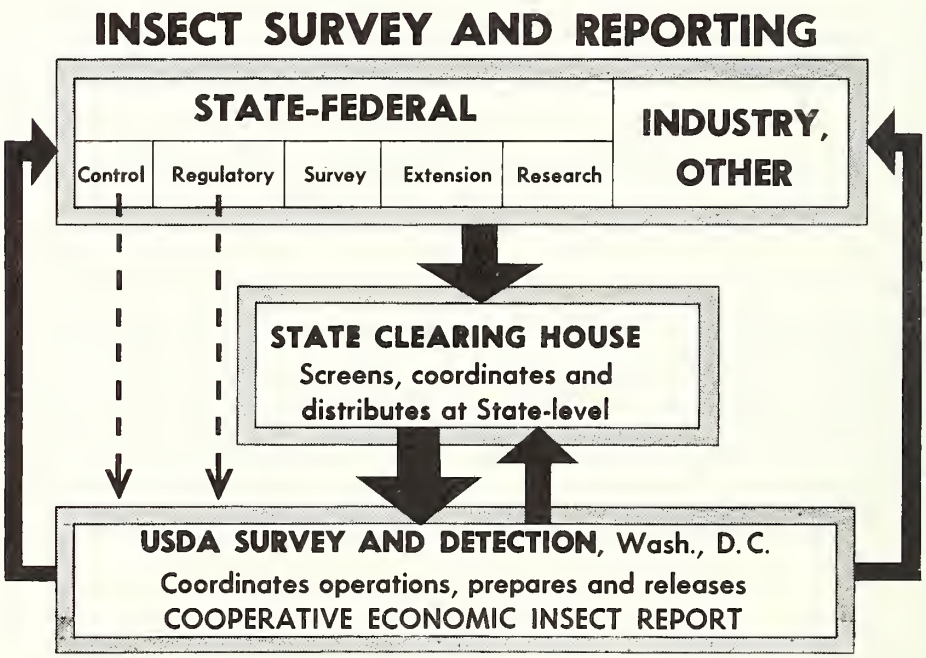
Approximately 3,000 Cooperative Economic Insect Report booklets are circulated weekly to personnel concerned with insect pest conditions. Information published in the report is filed in the permanent records of the Division. The files include over one-half million notes on some 25,000 domestic and 20,000 foreign insect species. These records are readily available to Federal and State agencies as well as to the public.

Most Recent Department Informational Aids:

Publications: Insects Not Known to Occur in the United States. Compilation of numbers 1-72 of series, 1957-1958.

Surveys Methods, 1958.

Slides: Series of 20 2x2 slides with legends, July 1959. Available for loan.



SOYBEAN CYST NEMATODE

History: The soybean cyst nematode (Heterodera glycines) occurs in Japan, Korea, and China (Manchuria). It was discovered in the United States at Castle Hayne, New Hanover County, North Carolina, in 1954 and since then has been found as indicated on the accompanying map.

Nature of Pest: This pest is a microscopic eelworm which penetrates and feeds inside rootlets. Later, the female larva begins to swell and break through the epidermis but remains attached to the rootlets. When the female dies, a cyst is formed which contains about 400 eggs. When the eggs hatch, the larvae emerge from the cyst and continue the cycle. A life cycle is completed in about 3 weeks, and five generations may be produced in one crop of soybeans. Soybeans and Adzuki beans are highly susceptible hosts, while snap beans, common vetch and lespedeza are less susceptible. Three new host plants are hemp sesbania, white lupine, and henbit deadnettle. The last named is a member of the Labiatae and is the first host reported not in the Leguminosae.

Severely attacked soybean plants become stunted and often yellow in color. Severe infestations may lower yields to a point where crops may not be worth harvesting. If this pest is allowed to spread, it could become a serious threat to commercial soybean production throughout the United States.

Survey, Quarantine, and Control: Soon after discovery of the pest, North Carolina authorities asked the Federal Government to assist in making a survey to determine the extent of the infestation. Early in 1955 the State Entomologist issued a notice of the presence of the pest in North Carolina to all state plant regulatory officials. A cooperative soybean cyst nematode control program was undertaken in March 1955 by the North Carolina State Department of Agriculture, the North Carolina State College of Agriculture, and the Plant Pest Control Division, ARS.

In March 1956, North Carolina imposed a quarantine on the movement of soil, plant parts, machines, and other articles or materials that might spread the infestation. A Federal quarantine to prevent spread of the pest became effective July 26, 1957. Portions of Arkansas, Kentucky, Mississippi, Missouri, North Carolina, Tennessee, and Virginia are now under regulation. Soil, underground parts of plants, soybeans, grains, ear corn, hay and other fodder, used farm and construction equipment, farm products containers, and processing machinery are included as regulated items. Harvesting, storing, and cleaning procedures have been developed to prevent many regulated articles from becoming infested. The Federal quarantine against the soybean cyst nematode permits the harvesting of soybeans, cotton, and other crops concerned, without undue inconvenience to the growers. Each State concerned has issued a parallel state quarantine or comparable instructions designed to protect uninfested areas within its own boundaries.

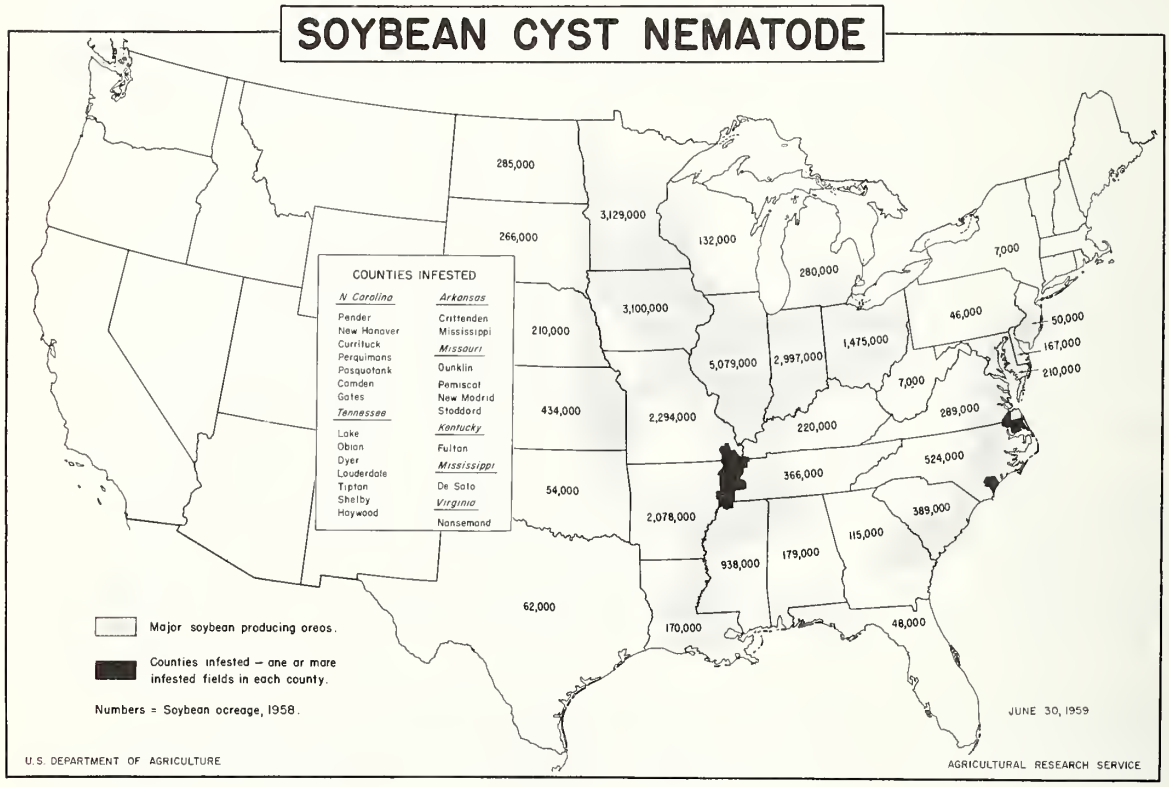
Appropriate agencies are conducting studies on the life history of the pest, evaluation of various nematocides in broadcast and row treatments, tests on varieties and selections of soybeans for resistance to soybean cyst nematode, and tests to determine any additional host plants. Crop rotation is an effective means of preventing buildup of the pest. The longer the period between planting of a host crop, the better the chances that light infestations will not survive. It is currently believed that a 3-5-year rotation will stop the buildup of soybean cyst nematode in soybean fields.

The Current Situation: Damage to soybean plantings from the nematode has been evident in North Carolina since the infestation was found there in 1954, but clearly defined damage to crops in the Mississippi Valley was not observed until 1958 when 200 acres were reported damaged in Tennessee. In this State, symptoms appeared and developed in spots throughout some 25 fields comprising approximately 1,600 acres in four counties.

There was a rapid buildup in soybean cyst nematode populations in several States during the fiscal year 1959, some growers having sustained a complete loss of their crops in a limited numbers of fields. By June 30, 1959, surveys revealed more than 29,100 acres of soybeans infested with soybean cyst nematode, distributed over 715 properties in 23 counties located in 7 States, as shown on the accompanying map.

In late May and early June of 1959, symptoms of field damage caused by this pest began to occur in previously infested areas. In some fields only small spots appeared but in others as much as 90 percent of a field showed nematode damage. Percentage-wise the greatest damage was in Tennessee, where it was estimated that 3 percent of the soybean crop was infested. A number of Missouri growers also experienced severe damage from the pest.

Research indicates that crop rotation on a 3 to 5-year basis is an effective and practical means of control. While some chemicals have been found to effectively reduce the soybean cyst nematode population by as much as 95 percent, or more, none has achieved complete eradication in early field experiments. Experiments by plant breeders demonstrate disease resistance in some commercial varieties of soybeans.



The Status of Soybean Cyst Nematode Infestations as of June 30, 1959:

State	Counties	Properties	Acres
Arkansas	2	184	7,315
Kentucky	1	10	943
Mississippi	1	1	300
Missouri	4	163	5,662
North Carolina	7	158	3,606
Tennessee	7	147	8,270
Virginia	1	52	3,099
Total	23	715	29,195

During the fiscal year ended June 30, 1959, soil surveys to detect soybean cyst infestation were made on 16,297 properties involving 515,314 acres of soybeans distributed over producing areas in 25 States. Growing plants were observed for symptoms on more than 523,000 acres, involving 23,524 properties. This 1959 fiscal year survey activity found infestation for the first time on 10,685 acres involving 263 properties.

Most Recent Department Informational Aids:

Publications: Soybean Cyst Nematode, ARS Special Report, ARS 22-29 Agricultural Research Service, August 1956.

The Soybean Cyst Nematode, A New Pest, PA 333, May 1957.

Quarantine: Federal and State.

Slides: Series of 9 2x2 slides with legends. Available for loan.

SWEETPOTATO WEEVIL

History: The sweetpotato weevil (Cylas formicarius elegantulus) was first recorded in Louisiana in 1875 and shortly thereafter in Florida and Texas—indicating that it was introduced through several Gulf Coast ports at about the same time. It probably came from Asia. At present it is known to occur in Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas.

Nature of Pest: The eggs of the sweetpotato weevil are small, yellowish-white, and oval in shape. The larva is a white, legless grub with a brown head, and when full-grown measures about 1/4-inch long. The adult is a snout beetle resembling a large ant. It prefers the tuberous root but will feed on leaves and vines. The grubs cause the principal damage by burrowing through the potato, leaving it with a bitter taste and unfit for human, and sometimes animal, consumption. Growers frequently have losses ranging from 20 to 50 percent of the crop in the field and additional damage in storage. The weevil is so abundant in some sections that sweetpotatoes cannot be grown profitably. It reproduces at the rate of 6 to 8 generations per year. The Louisiana State University and the State Extension Service estimated that this pest damaged the commercial crop of sweetpotatoes in Louisiana in 1946 to the amount of nearly $3,000,000.

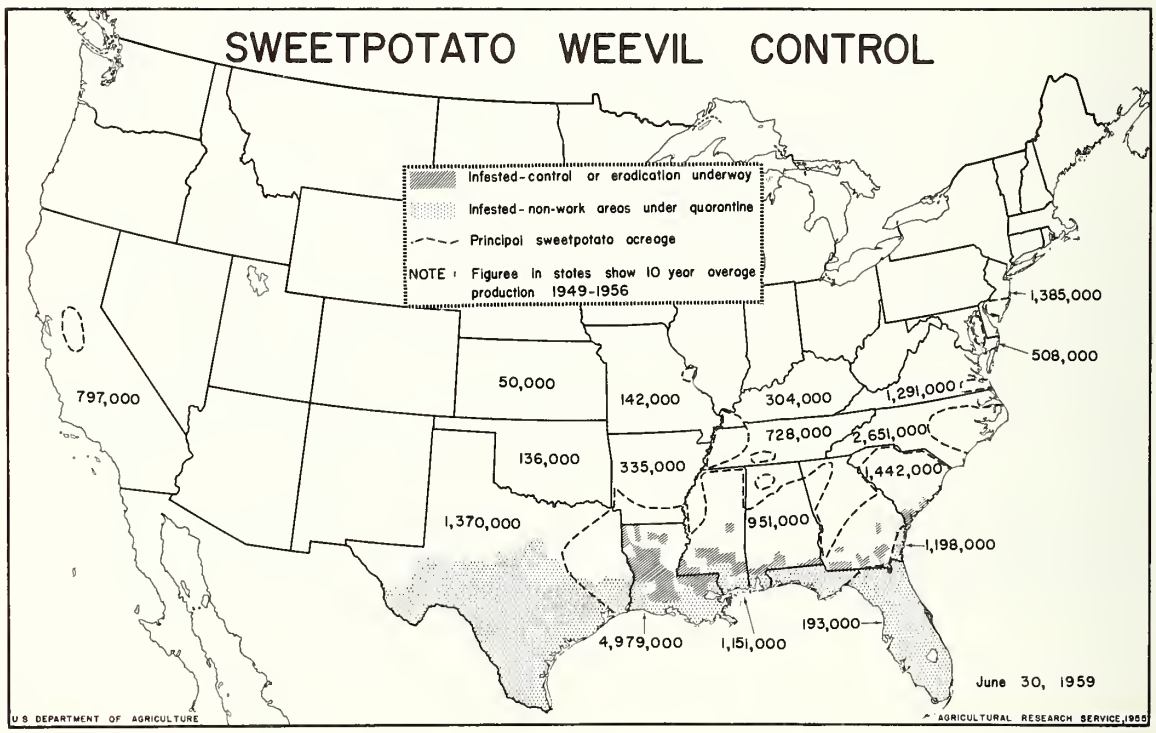
Survey, Quarantine, and Control: The total of more than 81,400 survey and regulatory inspections made in the coastal States from Louisiana to South Carolina, inclusive, during fiscal year 1959 reflects the interest in adequate control and eradication of the sweetpotato weevil. Survey activity includes: (a) Inspection

of sweetpotatoes and vine crowns during and immediately following harvest; (b) inspection of plant beds; mother rows; and volunteer potato plants; (c) inspection of storage remnants; and (d) inspection of potatoes while they are passing over washing and grading belts.

A Federal quarantine against the importation of sweetpotatoes into the United States because of the sweetpotato weevil has been in force since 1918. All other quarantines pertaining to the insect are promulgated by and under the authority of the respective States concerned. In addition to quarantines in the States of Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas, in which the pest now occurs, quarantines against the introduction of the pest are in force in the States of Arkansas, Arizona, California, North Carolina, New Mexico, Oklahoma, and Tennessee. Spread may occur when sweetpotato plants, seed, or table potatoes are moved from infested to noninfested areas.

Control of the sweetpotato weevil pest depends upon strict adherence to recommended procedures and constant care on the part of the grower to prevent reinfestation. The program objectives are: (1) To eradicate the weevil in areas where feasible; (2) to suppress population in the remaining areas, provided the extent of sweetpotato production warrants such action; and (3) to prevent its spread into uninfested areas. This requires making surveys to locate outlying infestations, establishing non-sweetpotato-growing areas, conducting cooperative control programs in areas of heavy commercial production, and treating sweetpotatoes shipped from infested areas.

For the past several years cooperating States have contributed about 75 percent of program costs, with State funds averaging more than 65 percent of the total funds expended since the program started.



The Current Situation: During the fiscal year 1959, the sweetpotato crop in six infested Southern States was protected from attack by the sweetpotato weevil through the application of insecticides to more than 2,549 sweetpotato seedbeds, the treatment with insecticides of some 12,448 acres of plantings, and the dusting at harvest of over 1,326,312 bushels of sweetpotatoes before storage in the fall.

Because of the effectiveness of the recently-approved insecticides, sweetpotato-growing is being expanded in northwest Florida, in Louisiana and, to some extent, in other States.

Most Recent Department Informational Aids:

Publication: The Sweetpotato Weevil, How To Control it, Leaflet No. 431, June 1959.

Quarantine: State.

WHITE-FRINGED BEETLE

History: The white-fringed beetle (Graphognathus spp.), which causes severe injury to field crops and ornamental plants, was first found in the United States in Okaloosa County, Florida, in 1936. Introduction was probably from South America, where it occurs in Argentina, Brazil, Chile and Uruguay. Infestations have been found in areas aggregating 701,811 acres in Alabama, Florida, Georgia Louisiana, Mississippi, North Carolina, and Tennessee.

Nature of Pest: All adult white-fringed beetles are wingless females. Emergence of the beetles from the soil begins in late May and continues into September and October. A few days after emergence the beetles begin laying eggs, cementing them in small masses to plant stems, sticks, debris, or soil particles. Lumber, building materials, cotton bolls, seed cotton, velvetbean pods, farm implements, and other such articles in contact with the soil may have eggs attached to them. The grubs, which develop from the eggs, feed on roots and underground stems of young plants in the spring. They gnaw the taproot and bottom part of the stem but feed very little on laterals. Grubs and adults have been observed feeding on 385 species of plants, including such important ones as cotton, corn, soybeans, velvetbeans, peanuts, potatoes, sweetpotatoes, tobacco, strawberries, kudzu, lespedeza, lupine, oats, and the roots of peaches, pecans, tung, and willow. Because it attacks a wide variety of crops, the white-fringed beetle is a potentially serious pest throughout the southern half, or more, of the United States.

Heavy damage to field crops, ranging as high as 70 percent, formerly occurred in the areas where the pest was originally found in 1936, 1937, and 1938. In some fields a high percent of the plants have been killed in areas ranging from a few square yards to large acreages. Even light populations can seriously damage truck crops. The threat of the pest is emphasized by the great variety of plants attacked, which includes almost every major crop plant grown in the United States.

Survey Quarantine, and Eradication: Program activities fall into four categories: (1) Surveys in regulated areas to determine the degree of infestation on which regulatory and control requirements are based; (2) surveys for the pest in areas where it is not yet known to be established, in order to discover small initial areas of infestation; (3) enforcement of Federal and State quarantines; and (4) eradication of infestations to prevent spread of the pest and to assist growers in preventing losses.

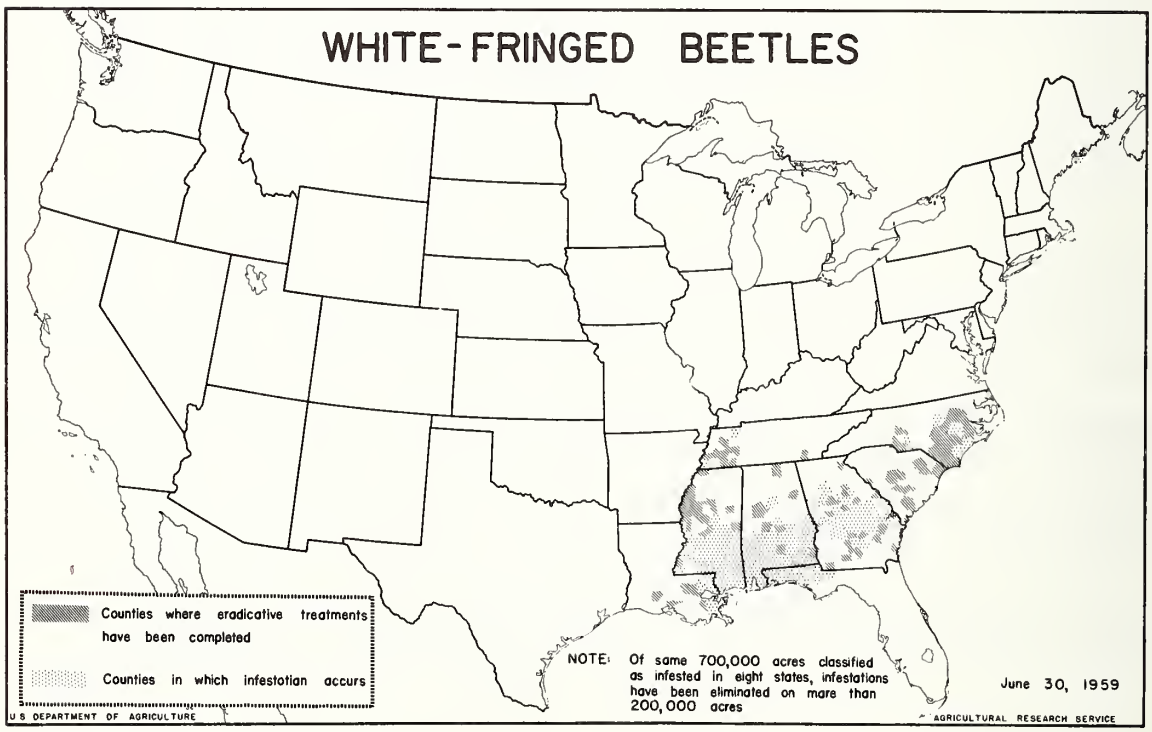
The interstate movement of host materials and carriers from parts of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee is regulated on account of the white-fringed beetle. An extensive list

of articles is regulated, including soil, as such, or associated with nursery stock, forest products, root crops, potatoes, peanuts, junk, seed, and equipment. These and other articles may carry eggs, larvae, or adults of the white-fringed beetle. Certain of these articles are exempt from certification requirements when acceptable sanitation and handling practices are used.

Acreage treated and later found free of beetles for three years is eligible for removal from regulation if isolated from other infestations or otherwise protected. A review is being made of survey results and treatments applied to areas in Louisiana, North Carolina, and Tennessee to determine if certain acreage may be removed from regulation.

Various emergency control methods such as ditching, trap crops, and flame throwers were used originally. These were followed by the use of calcium arsenate and cryolite as foliage applications. DDT, dieldrin, chlordane, and heptachlor are now used as soil or foliage treatments. The possibility of eradication of the beetle in a given infested area through effectiveness of these treatments becomes more and more encouraging. The value of such treatments is demonstrated by the fact that infestations for the most part have been kept at a low level, and spread has been retarded.

The Current Situation: Of the 701,811 acres where infestation has been found, more than 200,000 acres of the total have received eradication treatment. All known infestations have been eliminated in 87 of the 211 infested counties. In fiscal year 1959, soil treatments were applied to more than 114,811 acres and foilage treatments to more than 17,079 acres in the effort to eliminate white-fringed beetles. During the same period about 59,205 acres of contiguous territory were found to be infested.



Particular attention is being devoted to treating nurseries, railroad yards, and loading points to reduce or eliminate beetle populations as a means of preventing contamination of products being shipped, thereby reducing the hazard of long-distance spread. Accomplishments to date indicate that complete eradication of this pest from the United States is possible with an aggressive and expanded program.

Most Recent Department Informational Aids:

Publication: The White Fringed Beetle—How to Control It with Insecticides, How to Prevent Its Spread, Leaflet No. 401, Revised June 1958

Quarantine: Federal and State.

Slides: Series of 12 2x2 slides with legends, May 1958. Available for loan.

WITCHWEED

History: Witchweed (Striga asiatica), a parasitic flowering plant, was discovered for the first time in the Western Hemisphere late in the summer of 1956 seriously damaging corn in adjoining counties of North Carolina and South Carolina. While witchweed is a new pest in the United States, it is an old and widespread problem in the tropics and sub-tropics of the Old World. It is present in large areas of Asia, Africa, and Australia where it was known to exist as early as 1790. It was recognized to be a serious parasitic weed in South Africa as early as 1900.

Nature of Pest: It is a serious pest of corn, sorghum, and sugarcane as well as 60 other species of the grass and sedge families, including rice, wheat, oats, and barley. The roots of corn, sorghum, sugarcane, Sudan grass, and crab grass stimulate the germination of witchweed seed and then are parasitized by the pest. Other crops such as peanuts, sunflowers, cowpeas, soybeans, and castor beans stimulate seed germination without being parasitized.

Witchweed may be easily identified by its small brick-red or scarlet flowers, although they occasionally may be yellowish-red, yellow, or almost white. The leaves are slightly hairy. The plants rarely grow more than 8 to 9 inches high; however, they may reach a height of 18 inches. The weed develops underground for six weeks to two months; it is during this period that the principal damage is done to the host. After vegetative parts appear above ground, it develops like any other plant but still depends upon the host for water and soil nutrients. The plant thrives on a wide range of soil types but appears to prefer a light sandy soil. Symptoms of infestation include severe wilting, stunting, and yellowing of the host plant; eventually the leaves turn brown and the plant dies. Normally, witchweed plants produce from 50,000 to 500,000 almost microscopic seed per plant.

Survey, Quarantine, and Eradication: Surveys for witchweed begin in early June, or as soon as evidence of infestation in cornfields, indicated by sudden wilting of corn plants is apparent. After the pest appears above ground, surveys can be made rapidly, inasmuch as the witchweed blooms are rather striking in appearance. Inspection activity can continue until frost. A Federal quarantine became effective September 6, 1957. It applies to all infested areas and all crops and commodities produced in or moved out of such infested areas. As of June 30, 1959, requirements of the quarantine were limited to 12 southeastern counties in North Carolina and eight nearby counties in South Carolina. Regulated articles include: Soil, underground parts of plants, hay and other fodder, seed cotton, tobacco,

peanuts, ear corn, soybeans, used farm and construction equipment, and farm products containers. Harvesting and handling procedures and treatments have been devised to preclude contamination of regulated articles.

Activities associated with the marketing of crops in the infested areas have been carefully studied. Sanitation practices are rigidly enforced to prevent spread of the pest by activities associated with farm-to-market movement.

The long-range objective of the witchweed program is complete eradication. Methods to be used to accomplish this include: (1) The use of chemical herbicide treatments; and (2) cultural practices such as growing catch crops of corn, sorghum, Sudan grass, and sugarcane which promote witchweed germination. The catch crops are then plowed under before mature seed is produced on the witchweed plants. Farmers are being encouraged to adopt these cultural practices.

A field-scale test eradication program was initiated in May 1958 in North Carolina and South Carolina on 959 acres involving 68 farms. Under the plan the owners or operators of farms agreed to grow catch crops on their infested land. This field-scale test involved planting two catch crops during the growing season, plus a small-grain cover crop in the fall.

In addition, herbicides were applied to 4,252 acres on 1,358 farms in the infested Carolina counties. For the most part, the herbicides were applied to noncultivated acres on and around the farms where the catch crop or cultural type of control was in progress.

The results of this trial program were such as to warrant an all-out attack on witchweed in both cultivated and noncultivated infested acreages. Preliminary work was well underway in getting such a program started as the 1959 fiscal year ended. The planning and direction of this program is being developed jointly by the Plant Pest Control Division and State regulatory and control agencies. Witchweed eradication management practices are acceptable under the Department's conservation reserve program. Farmers who place their land in this program receive the conservation reserve payment in lieu of income from normal crop production.

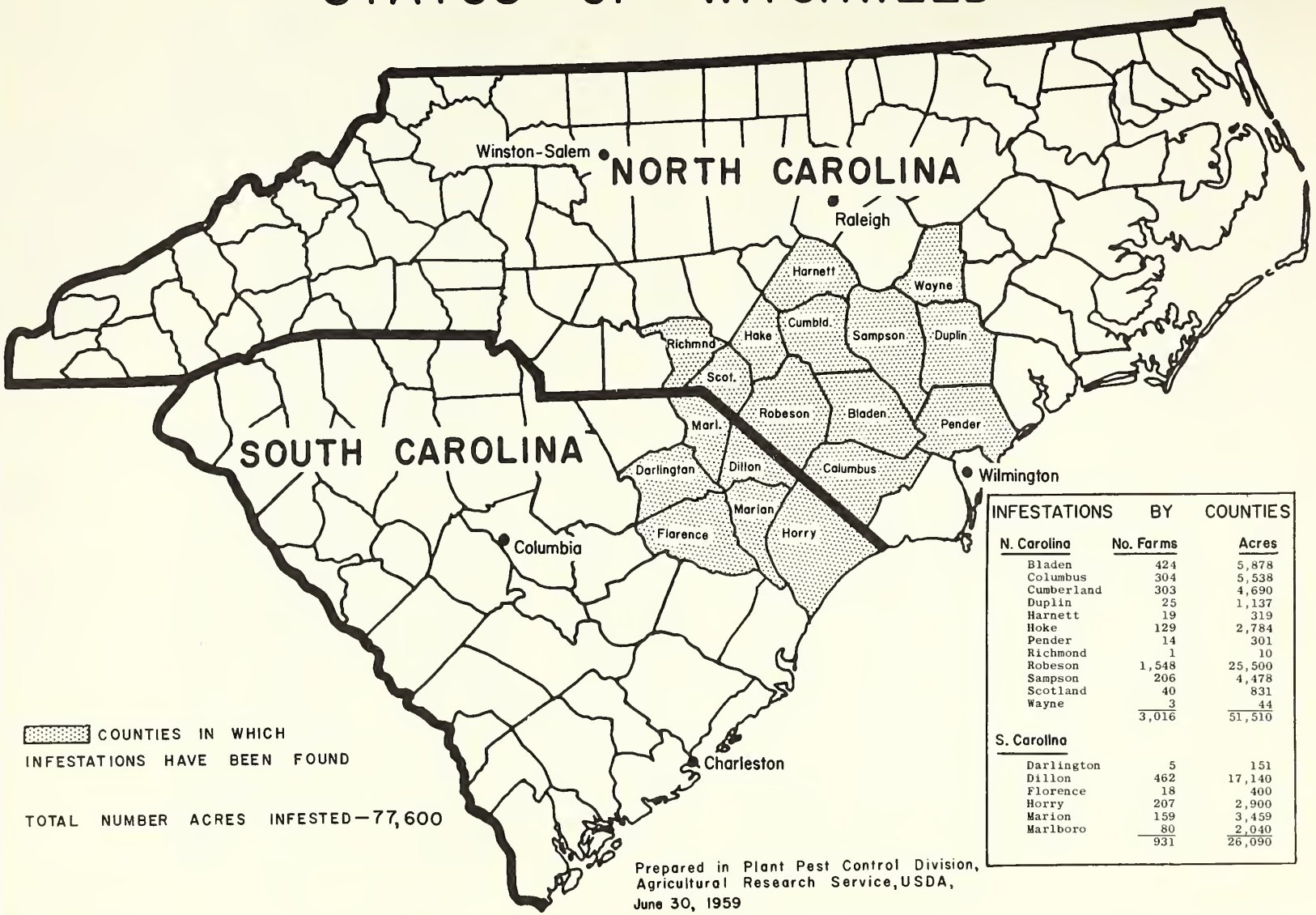
A laboratory has been established at the Border Belt Tobacco Research Station near Whiteville, North Carolina, under the technical direction of the weed control section of the Crops Research Division to conduct various studies on the witchweed problem. Special attention is being given to herbicides and fumigants, new varieties of "catch" and "traps" crops, and to improved methods for witchweed eradication.

The Current Situation: As of June 30, 1959, infestations had been found on 1,692 farms in North Carolina and 512 farms in South Carolina in a total of 17 counties. These farms with an aggregate of 77,600 infested acres, have about 60,147 acres under cultivation. Surveys are continuing in the Carolinas and in adjacent areas of bordering states.

Most Recent Department Informational Aids:

Publications:	Watch Out For Witchweed, PA 331, April 1957.
	Witchweed, ARS Special Report, ARS 22-41, Agricultural Research Service, June 1957.
Quarantine:	State and Federal.
Slides:	Series of 16 2x2 slides, with legends. Available for loan.

STATUS OF WITCHWEED



INFESTATIONS BY COUNTIES

N. Carolina	No. Farms	Acres
Bladen	424	5,878
Columbus	304	5,538
Cumberland	303	4,690
Duplin	25	1,137
Harnett	19	319
Hoke	129	2,784
Pender	14	301
Richmond	1	10
Robeson	1,548	25,500
Sampson	206	4,478
Scotland	40	831
Wayne	3	44
	3,016	51,510
S. Carolina		
Darlington	5	151
Dillon	462	17,140
Florence	18	400
Horry	207	2,900
Marion	159	3,459
Marlboro	80	2,040
	931	26,090

Prepared in Plant Pest Control Division,
Agricultural Research Service, USDA,
June 30, 1959

FOREIGN TECHNICAL ASSISTANCE PROGRAMS

History: Since 1954, the Plant Pest Control Division has assisted the United States Operations Missions of the International Cooperation Administration, and the governments of cooperating countries abroad, in the development of practical insect control programs in Lebanon, Iran, Pakistan, Afghanistan, Ethiopia, Tunisia, Iraq, Libya, Turkey, and the Sudan. Prior to this date, this program was known as the Regional Locust Control Program and was administered cooperatively by the State Department, the Foreign Agricultural Service, and the Bureau of Entomology and Plant Quarantine. The program is filling an important need in the foreign technical assistance programs.

Objectives: The objectives of the foreign technical assistance programs are: (1) To assist the United States Operations Missions in their efforts to aid the governments of cooperating countries in the development and direction of practical control programs against major insect pests; (2) to maintain facilities and services for a coordinated locust control program in the Near East, Africa, and South Asian countries; (3) to train nationals in aerial application of pesticides; (4) to assist in the development and organization of plant quarantine programs; and (5) to aid the United States Operations Missions in developing coordinated insect control programs in the various countries and to coordinate International Cooperation Administration insect control activities involving cooperation with international and other organizations.

With gradual improvement in the strengthening of plant quarantine services in the Middle East, complete and accurate information on plant pests within specific countries is highly important. This work was stepped up considerably during 1959. Information collected in the different countries serves as good background material for the Division's insect detection program.

Locust infestations were quite serious again during 1959, particularly in Iran, Iraq, Libya, and Ethiopia. Unusually severe infestations of the Moroccan locust, followed by heavy invasions of desert locusts and normal populations of native grasshoppers, together necessitated the application of control measures to over 5 million aggregate acres in Iran.

U. S. assistance throughout the Middle East and Africa was mostly of an advisory nature; organizations in the individual countries assumed practically all of the control operations.

The Second Plant Quarantine Short Course in the Middle East, sponsored by the U. S. Operations Mission and the Turkish Ministry of Agriculture, was given by the Regional Insect Control Project at Cayirova, Cervizli and Istanbul, Turkey, during the period of June 23-July 4, 1958. The host government assumed responsibility for conducting the short course after intensive planning and guidance of Regional Insect Control Project personnel. Sixteen Turkish participants were given instructions in plant quarantine activities.

The third course was given in Karachi, Pakistan, between November 24 and December 5, 1958, with 25 plant quarantine officials and inspectors in attendance.

A full-time regional entomologist was assigned to Turkey September 8, 1958. Major emphasis has been placed on pests of regional distribution and concern, with advisory and demonstrational activities predominating.

In Pakistan, the Central government released to both provinces all responsibilities for ground operations and eventually intends to turn over all field operations.

The entire plant protection program took on more of an extension apprach as demands on the government increased. As the work of the regional entomologist became primarily advisory and did not fit properly into the Mission-Ministry program, it was mutually agreed that the regional project withdraw during December 1958.

Since June 1958, a continuous project has been operating in Tunisia. The main interest of the Plant Protection Section of the Ministry of Agriculture is pilot training; demonstrational control of Medfly and other major pests of citrus, grain storage insects, peaches, and olives. Considerable training has been given to extension teachers through lectures and demonstrations.

Upon request from the government of the Sudan, two aircraft, pilots, and entomologists were despatched to Khartoum September 19, 1958, to assist in checking a serious locust invasion. This has led to a further request for assistance on a full-time basis which is expected to begin very early in fiscal year 1960.

In Ethiopia, major emphasis continues to be placed on pilot-mechanic training and the organization and administration activities with young Ethiopian plant protection officials and trainees.

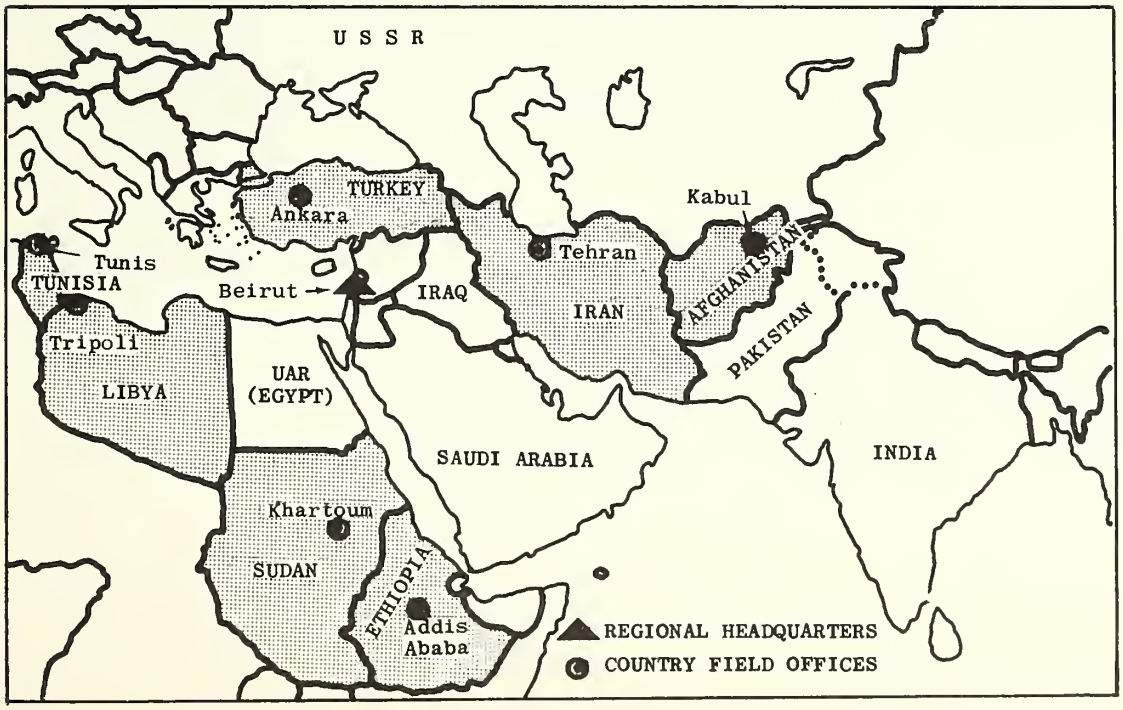
This work in Afghanistan has been hampered by lack of personnel. Elsewhere the regional insect programs continue to operate, with noticeable progress being made on the part of the country plant protection organizations.

Most Recent Department Informational Aids:

Publication: Locust—and other Insect Control, in Technical Cooperation Programs in the Near East, South Asia, and Africa, 1951-57. Miscellaneous Publication No. 770, released 1958.

REGIONAL INSECT CONTROL PROJECT

FOREIGN TECHNICAL ASSISTANCE PROGRAMS



PESTICIDE REGULATORY ACTIVITIES

Objective: The objective of the Pesticides Regulation Branch's program is the administration of the Federal Insecticide, Fungicide, and Rodenticide Act of 1947, as amended August 7, 1959, and those responsibilities assigned to the Department by Section 408 (1) of the Pesticide Chemicals Residue Amendment to the Federal Food, Drug, and Comestic Act. The insecticide act is designed to assure the users of economic poisons that these products will be effective for the purposes for which they are sold and that they may be used in a manner which will not result in injury to users or others who are exposed to them. These objectives are accomplished by a pre-interstate shipment review of labeling for products which are intended for interstate commerce to determine if the proposed labeling accurately describes the performance potential of the material and the mode of application which will allow for safe use. These determinations usually take place during the evaluation of labeling submitted for registration as required by the statute.

In addition to the registration review, the Branch samples interstate shipments of economic poisons and takes authorized legal action, when appropriate, against shippers of improperly labeled or adulterated products. In the administration of this act, close cooperation is maintained with the various State officials carrying out State pesticide laws. This cooperation is intended to promote uniformity in the administration of the Federal and State statutes.

The Pesticide Chemicals Residue Amendment to the Federal Food, Drug, and Cosmetic Act requires the Branch to certify the utility of each chemical for which a tolerance or exemption is sought, and advise the Food and Drug Administration as to the probable residues which will result when the specified crops are treated in accordance with label directions.

Registration Activities: During the fiscal year 1959 registration activities under the act reached the highest level since 1949. During the year 4,876 new products were registered, amended labeling was accepted for 4,237 products, and 2,856 distributors' labels were registered. These figures represent significant increases in each category over the previous year, and the new products registered show a cumulative total of over 56,000 products which have been registered since the passage of the 1947 act. A total of 2,545 registrations were canceled during the year. The majority of these had been registered in the fiscal years 1949 and 1954 and these cancellations resulted from the five-year survey of registrations. These products are accepted for registration only after reasonable evidence as to their effectiveness and safety of their use has been obtained by the Branch. Unless specifically labeled with some geographic limitation, the products are accepted for use on the basis of foreseeable conditions as they exist throughout the entire United States. To promote uniformity in the Federal and State registration programs, cooperating States are informed of the bases on which these materials were accepted for Federal registration. State officials are thus aided in their local registration programs, but when necessary can modify the acceptable pattern of use of these materials to fit special conditions which may exist within their States.

Enforcement Program: This work is initiated when Federal investigators collect official samples from interstate shipments of economic poisons. These samples are analyzed chemically and tested biologically to determine compliance with labeling claims. When violations are detected, legal action may be initiated. Cooperative agreements have been effective with most States under which the Branch is furnished results of analyses by State chemists which may ultimately provide the bases for possible Federal actions. During the fiscal year 1959, 1,310 official samples were collected. This represents an increase of 4 percent over the total samples collected last year. A total of 218 serious violations were detected. This is 16.6 percent of the products sampled. As a result, 193 registered letters advising of violation, and 25 citation and/or seizure cases were

initiated. An additional 121 minor violations were corrected by correspondence. A total of 283 products offered for import were investigated under the cooperative agreement with the Customs Service of the U. S. Treasury Department; 9 of these products were detained until brought into compliance with the act.

The hospital disinfectant survey initiated in fiscal year 1958 was continued this year. Branch investigators surveyed 180 hospitals to collect samples of hospital germicides and disinfectants and to determine the number and extent of such products in use by these institutions. These investigations revealed that few, if any, hospitals are depending on any one germicide for all disinfecting processes. It further showed that an average of four germicides are being employed in each hospital. Some institutions were using as many as 12 of these products, while others were employing only two. Some significant indications of the pattern of use with products of different chemical types have been obtained from data collected to date. However, additional visits to 120 more hospitals in other unsampled geographic areas are planned. Through June 30, 1959, 216 samples of germicides and disinfectants were collected. 37 percent of these were found to be deficient under one or more provisions of the act. This is a rather alarming situation and clearly indicates the necessity for continuing this special project during the coming fiscal year with a view to reducing the number of violations. A number of seizures and citations have been made or are being made with the products found deficient.

Pesticide Chemicals Residue Amendment (P. L. 518): The Branch processed 26 petitions for tolerances or exemptions during the fiscal year. This brings to a cumulative total of 150 the number of certifications of usefulness and opinions on residues which have been transmitted to the Food and Drug Administration since this law was passed in July of 1954. In excess of 2,000 pesticide chemical uses registered under the Federal Insecticide, Fungicide, and Rodenticide Act are now covered by tolerances or exemptions. Eight chemicals are now recognized as safe for use on raw agricultural commodities. As has been the case every year since Public Law 518 was passed, many additional uses of pesticide chemicals on food crops were accepted upon the acquisition of evidence that they would leave no residues when used as directed. These actions represent appreciable progress in making legally available a significant number of chemicals for use on food or feed crops.

Current Situation: On August 7, 1959 the Federal Insecticide, Fungicide, and Rodenticide Act was amended. The effect of this amendment is to bring under the jurisdiction of the act and to make subject to the provisions of Public Law 518 nematocides, plant regulators, defoliants, and desiccants. The effect of this legislation is to significantly increase the number of commercial products to be regulated by the act. The law may not become fully effective with respect to all products until March 5, 1961. Branch personnel spent considerable time during the year working with sponsors of the legislation to incorporate the necessary provisions into the amendment, and to determine the administrative and program modifications necessary to the efficient administration of the amended law.

OTHER PROGRAM ACTIVITIES

In addition to the programs reviewed on the preceding pages, the Plant Pest Control Division has responsibility for conducting survey, regulatory, or control work relating to several other plant pests, as described below.

Beet Leafhopper

The beet leafhopper is a serious menace to sugar beets, beans, tomatoes, and other crops in the western part of the United States. It transmits a virus, the causal agent of a destructive disease known as curly top. This insect breeds in the southern portions of California, Arizona, New Mexico, and Texas during the winter months and moves into the more northerly states as the season develops.

The Plant Pest Control Division assumes the primary responsibility for conducting service surveys to provide information on the status of this pest. These surveys start in the southern-most areas early in February. West of the Rocky Mountains they begin in California and Arizona and extend north into Nevada and Utah and consist of a series of three observations at approximately 1-month intervals. The preliminary surveys are followed by two or three additional observations in the affected northern States, later in the summer.

East of the mountains, beginning in Texas and New Mexico, the early survey moves northward into Kansas and Colorado. A later survey in eastern and western Colorado, appraising the movement of leafhoppers and damage, is tied in with observations in the northern States.

At the completion of each survey the findings, along with a brief analysis and forecast, are released through cooperating agencies, such as the State Extension Service. The results of the survey are also carried in the Division's "Cooperative Economic Insect Report."

White Pine Blister Rust

To protect valuable stands of white pine timber from infection by the destructive white pine blister rust, all States and the District of Columbia have been placed under Federal quarantine. The interstate movement of gooseberry and currant plants, other than European black currants, all of which are alternate hosts of the disease, is regulated or prohibited to States or parts thereof in which rust control areas have been established. European black currant plants are permitted unrestricted movement into and among the States of Arkansas, Florida, Kansas, Louisiana, Mississippi, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas, but movement elsewhere is prohibited. Five-leaved pines may move freely within an area comprised of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and the southern two-thirds of California. Movement of such pines to that area for reforestation purposes can be made from approved nurseries under permit. White pine blister rust control work is a function of the U. S. Forest Service.

Boll Weevil

The boll weevil hibernation survey is conducted in cooperation with the Entomology Research Division and various State agencies. Information obtained from the survey assists farmers, agricultural workers, and industry in determing the potential boll weevil infestation the following season.

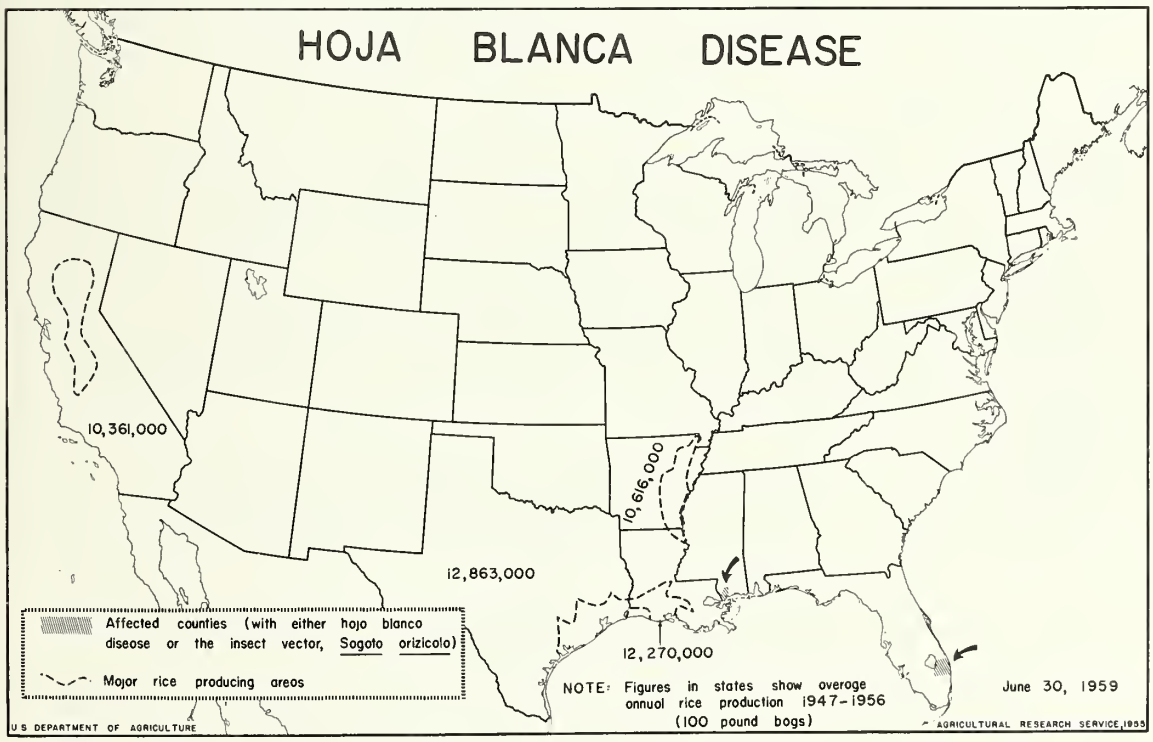
Trash in which the weevils hibernate is collected in the vicinity of cottonfields. Two surveys are conducted, one in the fall following frost to determine the number of weevils entering hibernation, and the second in the spring while the weevils are still in hibernation, to determine the number surviving the winter. Survey findings are released through State and Federal sources, including the "Cooperative Economic Insect Report."

Halogeton

Halogeton glomeratus, which is poisonous to sheep and cattle, was probably introduced into this country from Asia during the early 1930's. It is now well established in parts of California, Nevada, Idaho, Utah, Colorado, Montana, Oregon, and Wyoming. The acreage of halogeton infestations had risen to well above $10\frac{1}{2}$ million acres by early fiscal year 1958. The poisonous qualities of the plant were not fully apparent until 1945, when 1,620 sheep, under one ownership in Idaho, died while trailing from summer to winter range. Following passage of the Halogeton Act by the 82d Congress in July 1952, the U. S. Departmeet of Agriculture was charged with responsibility for the control on State, private and Government land under its jurisdiction. The former Bureau of Entomology and Plant Quarantine was assigned the job of making the appraisal survey. Initial attempts at chemical eradication were not satisfactory. The periphery of the infested areas extends for hundreds of miles, and there are many avenues of spread. Therefore an adequate containment program would be a costly undertaking. Fortunately, animals will not eat halogeton if other forage is available.

Hoja Blanca

Hoja blanca, a serious disease of rice, was found within the United States for the first time in Florida at the Everglades Experiment Station and in a nearby area near Belle Glade in the fall of 1957 in three fields comprising 311 acres. This disease, also known as "white leaf," occurs in Cuba, Venezuela, the Dominican Republic, Guatemala, El Salvador, Surinam, Costa Rica, and Colombia.



Immediate arrangements were made for destruction of the infested rice plantings. Malathion sprays were applied by ground equipment and aircraft to the infested fields and environs to destroy suspected insect carriers, rice on infected fields was plowed under, and growers agreed that no rice would be planted the following year. Detection surveys were inaugurated in 16 southern Florida rice-growing counties and a check was made for volunteer rice in fields of former plantings. By June 30, 1958, no additional infestation in Florida had been found beyond the Belle Glade area of Palm Beach County, and malathion sprays had been applied to approximately 2,100 acres on, and in the environs of, the three infested properties at Belle Glade.

At the close of the year, ending June 30, 1959, additional detection surveys had been conducted in rice-producing areas of Arkansas, Florida, Louisiana, Mississippi, and Texas. From the date of the initial infestation in Florida surveys had been made on 41,805 acres on 823 properties.

Survey results to June 30, 1959, revealed infestation on two farms on the Gulf Coast in Hancock County, Mississippi, in addition to the infestations at Belle Glade, Florida. Detection surveys will continue or be initiated in additional rice-producing areas during the coming year.

Potato Psyllid

The potato psyllid survey is predicated on the fact that the insect moves from breeding areas in southern portions of Texas, Arizona, and California, into northern States, where it transmits the causal agent of a destructive disease, called psyllid yellows, to potatoes, tomatoes, and other hosts.

Two surveys are made each year, the first in March in the southern portions of California, Arizona, and western Texas. Data resulting from this survey are released through State and Federal sources as a forecast of psyllid populations to be expected in northern States. The second survey consists of five separate surveys made at two-week intervals, beginning in May, in established areas within the States of Utah, Wyoming, Nebraska, and Colorado. Results on each of these five surveys are also released through State and Federal agencies.

Rhododendron Rust

European Rhododendron rust, which is common in British Columbia, Canada, and parts of Europe, has been under observation since it was first discovered at Long Beach, Washington, in 1954. The States of Oregon and Washington and the United States Forest Service do not consider this rust to be a serious threat. When first attempts were made to control the disease only two nurseries in the United States were known to be infested. Subsequent surveys indicated that this disease may be in many plantings in the Northwest. Since the cursory surveys were started in 1958, the disease has been found on 27 properties, 20 of which are nurseries in California, Oregon, and Washington. Inspection of 113 plantings in Eastern, Midwestern, and Southern States was made with negative results, although growers in these States had received material from western nurseries before the presence of the rust had been established.

Rhododendron rust does not appear to be a threat to the spruce forests in the United States and Canada, as it is in Europe. Indications are that it is a problem confined to nurseries and homeowners growing ornamental plants. An effective control treatment was developed through tests made at Long Beach, Washington.

It appears that the practical approach to this problem is through local control by growers to prevent, insofar as possible, the shipment of infected plants.

GPO 957236

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

BARBERRY ERADICATION

July 1, 1958 - June 30, 1959

In Cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITIES

A. Accomplishment for the fiscal year

State and Federal workers during the year inspected 5,236 square miles for rust-susceptible barberry and mahonia bushes. Initial coverage, consisting of 13 square miles in Missouri and 2,993 square miles in Kansas, is included in the total area inspected. The remaining square miles involved rework of previously infested areas. A total of 32,154 barberries was destroyed on 981 new locations and previously infested properties. Significantly, regrowth was found on only 16 percent of 4,181 locations cleared of bushes on previous inspections. Accomplishments this year and revaluation of the future requirements resulted in placing 4,630 square miles on maintenance and inactivating 1,149 properties that were at one time infested with barberry bushes.

B. Major deviation from work plan

All work was completed according to plan, with only minor deviation.

C. Status of program at close of year

Originally, 676,531 square miles in the States of the Central Region were scheduled for inspection. Work during the subsequent years reduced this territory so that only 37,796 square miles will require future inspection. This means that 638,735 square miles have been placed on maintenance. The areas requiring future work include some of the most rugged terrain, where barberry bushes have had many years to become established, and, due to heavy seeding, new bushes continually recur. This condition will induce a control problem for many years.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and direction

Field activities for the barberry eradication program were conducted in accordance with previously prepared work plans agreed upon by the Division personnel and appropriate State officials. The State supervisors in charge directed the over-all phases of the comprehensive work program in each of their assigned areas, following periodic consultations with officials of the cooperating agencies.

B. Technical assistance

Technical assistance was provided by Plant Pest Control personnel to property owners and farmers by demonstrating eradication procedures and encouraging them to destroy harmful barberries on their properties. Vocational agriculture and science classes

were given field demonstrations of eradication methods. These groups were encouraged to learn the identifying characteristics of the rust-susceptible barberry and to report suspect plants whenever found. County agents were supplied with informational and exhibit materials and assistance in their program service activities.

Plant pathologists, Experiment Station workers, and Extension specialists provided information to farmers and agricultural groups concerning the importance of barberry eradication to the stem-rust-control program.

The Crops Research Division prepared the annual report concerning the rust development in the uniform rust nurseries, established in most States by the Agricultural Colleges. This group reported on the development of stem rust during the growing season and assisted in the determination of the annual stem-rust estimates.

C. Survey

Preliminary to the organized field operations, reconnaissance surveys were made of areas to observe the prevalence and age of barberry regrowth. On the basis of these observations, determinations were made as to type of work required, manpower needed, and estimated cost of the operation. These preliminary surveys were made by qualified personnel, who were generally familiar with the infestations scheduled for inspection.

Annual stem-rust surveys were made in conjunction with program activities in 1958. The objectives of the surveys were to observe rust development and record severity and prevalence, and to estimate the damage caused by stem rust. In addition, collections were made of rusted grain plants and infected barberry leaves for race determination by the Cooperative Rust Laboratory.

Stem-rust damage in 1958 was very light east of the Rocky Mountains. Only in the Virginias was loss to wheat estimated at one percent. However, an unusual amount of rust developed in the Pacific Northwest, in an area comprising northeastern Oregon, eastern Washington, and contiguous areas of Idaho. Statewide damage in Oregon was estimated at 2.2 percent, and only 0.3 percent in Washington. The over-all damage to oats in the United States was even less than to wheat. Little or no damage occurred to barley and rye.

Stem-rust development began in the fall of 1957 from two sources: rust which apparently oversummered in the Panhandle area of Texas and then spread to the rolling plains areas of that State; and rust from the Northern States, which was less abundant than in some seasons despite favorable moisture conditions. However,

by the end of October the north-to-south movement of rust spores was largely ended by freezing temperatures as far south as Oklahoma and parts of Texas. There was little winter survival of stem rust in the South because of persistently cold, wet weather. Cool weather continued in the spring in the grain-producing areas northward, with the result that stem-rust development and spread was slow.

Slide exposures were made at 27 stations throughout the wheat-growing areas. The maximum number of spore counts occurred during the second half of May in parts of Texas and in Wichita, Kansas. Spore counts did not increase greatly in June, and the largest count on a single slide was made at the North Platte, Nebraska, station on July 12. At the spring-wheat stations, stem-rust spore counts were considerably smaller.

From 566 uredial collections of wheat stem rust, 27 races and subraces were identified among 775 isolates. Race 56 comprised 29 percent of the isolates; race 11 comprised 23 percent, an increase influenced by the unusually large number of isolates from the Pacific Northwest; race 15B, 18 percent; the 17-29 race group increased to 16 percent; and race 38 comprised 5 percent. In the spring-wheat area, race 15B was identified in 45 percent of the isolates, whereas the 17-29 group was found only on screening varieties in nurseries in the spring-wheat area.

Among 138 uredial and aecial isolates of wheat stem rust from the Pacific Northwest, 15 races and subraces were identified, 6 of which were not found elsewhere in the United States. Race 11 was the most prevalent among uredial isolates in the three northwest States.

Seven races and one subrace of oat stem rust were identified among 286 uredial isolates from 234 collections. Race 7 (combined with 12) comprised 54 percent of the isolates; race 8 (with 10), 26 percent; race 2 (with 5), 14 percent; 7A about 5 percent; and race 6, 1 percent. Race 8 was identified for the first time in California collections.

From 29 barberry collections, 16 races and subraces of wheat stem rust were identified among 43 isolates. Race 11, the 17-29 group, and race 24 occurred most frequently.

D. Eradication or control

During the year the farmstead type of inspection was completed on 2,993 square miles in Kansas and 13 square miles in Missouri. This inspection was accomplished by systematically foot-scouting yards, orchards, wood lots, and fence rows on the sites of, and immediately adjacent to, occupied or abandoned farm dwellings, cemeteries, school yards, rural industrial areas, and planted groves. Cities and towns were systematically scouted in the

areas selected for the farmstead work. This type of coverage was used in initial work to establish the pattern of barberry distribution.

Inspections consisted of the rework of 2,230 square miles. This involved the systematic foot-scouting of all natural and planted timber and all other uncultivated areas, including fence rows, stream banks, yards, orchards, and wood lots in urban and rural areas. Intensive scouting methods were employed in territory of known escaped bushes totaling 2,129 square miles of this entire area.

In most of the barberry-infested areas, the bushes were scattered. These isolated plants were eradicated with Ammate (ammonium sulfamate) by applying the chemical to cut-off canes at ground level. In Ohio, where the escaped barberries are more numerous in some areas, a hormone-type chemical was also used. In these areas an oil solution of MCP or Brush Killer 32-P proved effective by thoroughly spraying the basal stems and drenching the soil adjacent to the bushes.

During the year, 5,236 square miles were inspected by State and Federal workers and 32,154 barberries were destroyed on 286 new and 695 previously infested properties. These accomplishments placed 4,630 square miles on maintenance and relegated 1,149 properties to the inactive category.

E. Regulatory

Provisions of the Federal Black Stem Rust Quarantine 38 regulate the interstate movement of all species and varieties of barberry, mahonia, and mahoberberis plants, fruits, and seeds. Only plants of the species and varieties that have been tested for reaction to stem rust and found to be immune or highly resistant were permitted to move interstate.

During the year inspections were made and permits issued to 206 nurseries and 36 dealers in the Central Region who have complied with the provisions of the quarantine.

During the year, rust-susceptibility tests were continued on a number of species and hybrid barberries. Two new varieties and one strain of Berberis thunbergi have been recommended for inclusion in the list of resistant or immune barberries. Tests will be continued on a number of others.

F. Methods improvement

No changes in procedures and techniques.

G. Other

The principal cooperators of the stem-rust-control program during the year were: State Departments of Agriculture and/or Conservation, State Extension Services, State Experiment Stations, the Rust Prevention Association, and farm operators.

The States, through the Chief of Plant Industry, or the State Entomologists, participated in the joint planning and direction of the program operations. Extension Service personnel assisted with the informational activities and in recruiting local field workers. State Experiment Stations in some States provided office, greenhouse, and storage space, and station personnel assisted with the epidemiology phase of the program. The Rust Prevention Association provided invaluable information concerning crop and rust development during the growing season, assisted with the informational activities, and made invaluable contacts with State cooperators, et al. Farm operators provided storage for equipment and some assistance in the actual field operations. In a number of cases property owners on their own initiative destroyed bushes found on their properties.

The program services were conducted principally through the facilities of, and in cooperation with, the Extension specialists, county agents, and the publicity section of the State Departments of Agriculture. The Division provided informational data and exhibit materials and assisted in disseminating them to farmers, property owners, and agricultural agencies.

Division and cooperating personnel discussed program activities informally at 16 farm and civic group meetings, crop shows, college and high school agriculture and service classes. The sound film, "Stem Rust--Airborne Enemy of Grain," was used on 148 occasions by Division and cooperating agencies. These personnel also participated in 15 radio and TV programs.

During the year 23,757 bulletins and circulars were distributed. Exhibits were placed at 10 agricultural gatherings and 17 feature and news stories appeared in various newspapers and farmer publications.

III. RECOMMENDATIONS FOR COMING YEAR

No material changes are recommended for the over-all Barberry Eradication Program next year.

Barberry Eradication Accomplishments - Fiscal Year 1959

State	Square Miles Worked: Initial	Square Miles Worked: Rework	Properties Found Infested: New Props.	Properties Found Infested: Old Props.	Number Old Props. Inspected	Bushes Destroyed: Vulgaris	Bushes Destroyed: Native	Inspections: Nursery	Inspections: Dealer
Illinois	0	20	0	1	39	3	0	31	6
Indiana	0	22	0	7	120	42	403	11	0
Iowa	0	759	42	63	567	1,888	0	7	2
Kansas	2,993	0	21	4	22	96	0	10	0
Kentucky	0	0	0	0	0	0	0	12	0
Michigan	0	371	93	241	1,062	15,937	0	24	3
Minnesota	0	192	28	52	349	468	0	22	14
Missouri	13	19	4	3	204	11	0	10	6
Nebraska	0	70	8	7	306	64	0	2	0
North Dakota	0	0	0	0	0	0	0	1	0
Ohio	0	317	39	87	552	10,927	0	71	0
South Dakota	0	42	2	18	37	44	0	1	0
Wisconsin	0	418	49	212	921	2,271	0	9	1
Totals	3,006	2,230	286	695	4,181	31,751	403	211	32

Summary of Associated Activities - Fiscal Year 1959

State	Public Meetings Attended	Presentations: Talks	Slides	Films	Radio	TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins	Circulars	Infest. Maps & Posters	Other
FEDERAL												
Illinois	-	-	-	-	-	-	-	-	100	-	-	-
Indiana	-	-	-	-	-	-	-	-	12	-	-	-
Iowa	1	-	1	1	-	-	4	-	100	2,000	-	-
Kansas	2	2	-	1	-	-	2	1	-	6,800	-	202
Michigan	-	10	6	11	-	-	3	-	4,310	-	-	641
Minnesota	-	-	-	-	-	-	-	1	312	1,726	3	3***
Missouri	-	-	-	-	-	-	1	-	-	250	-	-
Nebraska	8	8	3	7	-	-	1	3	318	- -	-	200
N. Dakota	1	-	-	-	-	-	-	-	50	50	-	-
Ohio	-	1	1	11	-	-	-	-	170	1,500	-	128
S. Dakota	3	3	3	-	1	-	3	2	350	150	-	-
Wisconsin	-	-	-	-	10	-	2	-	100	350	250	-
Subtotals	15	24	14	31	11	-	16	7	5,822	12,826	253	1,174
COOPERATORS												
Illinois	-	-	1	2	-	-	-	-	279	-	-	65***
Indiana	-	-	-	7	1	-	-	-	160	-	-	80***
Iowa	-	-	-	22	-	-	-	-	-	3,000	-	-
Michigan	-	5	-	14	-	-	-	-	-	-	-	-
Minnesota	-	-	-	41	-	-	1	-	- -	-	-	-
Missouri	-	-	-	6	-	-	-	-	-	-	-	-
Nebraska	-	6	-	2	-	-	-	1	-	-	-	-
N. Dakota	1	1	-	-	2	1	-	-	-	-	-	-
Ohio	-	-	-	10	-	-	-	-	170	1,500	-	-
Wisconsin	-	-	-	13	-	-	-	-	-	-	-	-
Subtotals	1	12	1	117	3	1	1	3	609	4,500	-	145
GRAND TOTALS	16	36	15	148	14	1	17	10	6,431	17,326	253	1,319

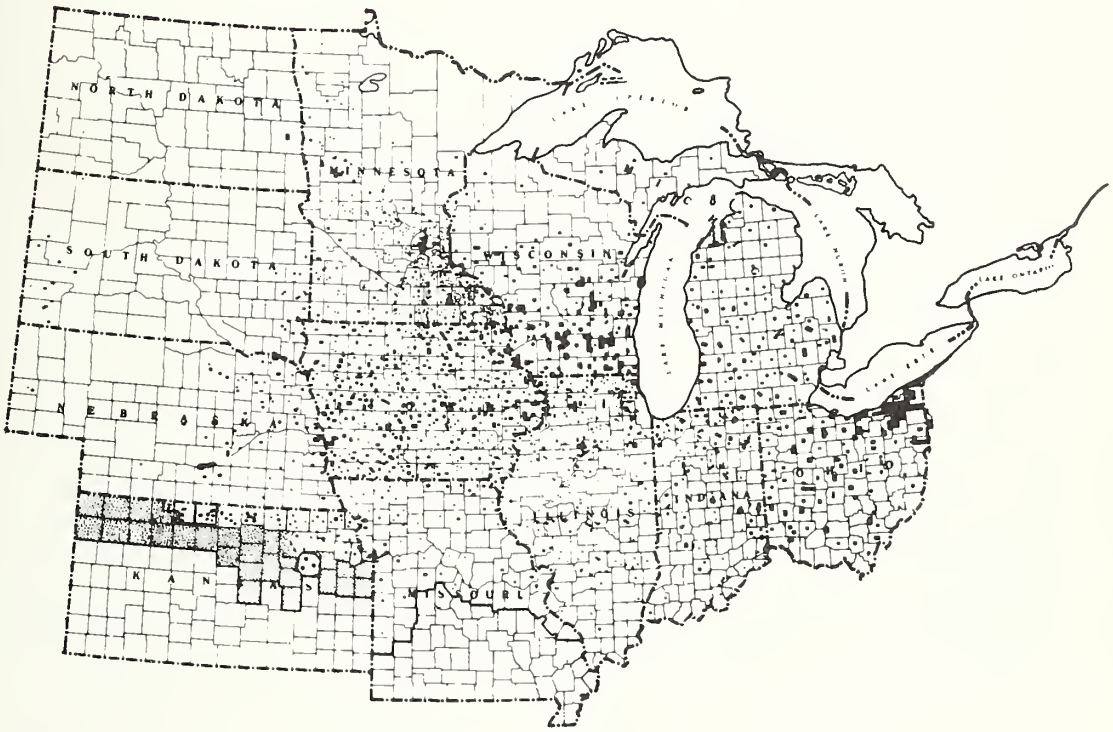
*Written by Federal personnel for release direct or through cooperators. **Conservative estimate.
***Microscopic slide sets.

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1918-1959

STATE	Square Miles										Properties			Barberry Bushes Destroyed		
	Total in State to be worked	Number Covered				Number Requiring Work One or More Times				No. Requiring No Future Work	Total Found to Date	No. Needing One or More Reinspections	Number Completed	Common	Native	Total to Date
		Initial	Work	Rework		Farmstead		Intensive								
		Farmstead	Intensive	Farmstead	Intensive	Initial	Rework	Initial	Rework							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Illinois	56,043	56,043	34,679	4,659	7,747	0	0	0	727	55,316	20,051	2,880	17,171	2,660,239	89,781	2,750,020
Indiana	36,045	36,045	27,329	8,405	3,472	0	299	14	233	35,499	7,012	810	6,202	200,060	212,118	412,178
Iowa	56,167	56,167	44,486	4,380	11,193	0	613	304	4,341	50,909	15,838	4,980	10,858	1,322,964	125	1,323,089
Kansas	32,800	11,116	0	0	0	21,684	0	0	229	10,887	253	253	0	2,397	1	2,398
Michigan	57,481	57,481	26,637	17,096	10,598	0	0	19	1,349	56,113	19,219	4,905	14,314	6,731,082	16	6,731,098
Minnesota	80,883	80,883	32,958	28,742	7,861	0	0	0	1,307	79,576	9,332	2,400	6,932	1,013,882	0	1,013,882
Missouri	37,201	19,737	17,641	789	928	0	0	32	208	36,961	1,919	684	1,235	24,563	0	24,563
Nebraska	77,268	77,268	36,832	34,966	7,249	0	0	0	519	76,749	4,944	228	4,716	149,071	0	149,071
North Dakota	70,183	70,183	1,276	30,105	417	0	0	0	21	70,162	1,084	12	1,072	39,562	0	39,562
Ohio	40,740	40,740	32,197	6,289	12,020	0	0	0	2,626	38,114	17,658	2,920	14,738	3,797,555	0	3,797,555
South Dakota	76,868	76,868	12,906	4,523	1,512	0	0	0	208	76,660	1,572	85	1,487	136,482	0	136,482
Wisconsin	54,852	54,852	21,314	23,886	10,878	0	0	0	3,063	51,789	18,031	6,321	11,710	5,719,227	0	5,719,227
Totals	676,531	637,383	288,255	163,840	73,875	21,684	912	369	14,831	638,735	116,913	26,478	90,435	21,797,084	302,041	22,099,125

BARBERRY ERADICATION
CENTRAL REGION

STATUS JULY 1, 1959



Area requiring intensive work	15,200	**square miles**
Area requiring farmstead work	22,596	**square miles**
Area on maintenance	638,735	**square miles**

Barberry Eradication - Cooperative Aid Received - Fiscal Year 1959

State	Cash and Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 900	$ 0	$ 0	$ 0	$ 900	$ 4,000	$ 4,900
Indiana	5,600	0	500	0	6,100	2,000	8,100
Iowa	4,500	0	0	2,400	6,900	5,700	12,600
Kansas	4,900	0	0	0	4,900	2,000	6,900
Michigan	17,700	21,700	900	700	41,000	5,700	46,700
Minnesota	18,200	200	0	1,100	19,500	7,300	26,800
Missouri	3,100	0	0	0	3,100	3,100	6,200
Nebraska	5,100	0	0	700	5,800	2,000	7,800
North Dakota	2,400	300	0	400	3,100	2,100	5,200
Ohio	14,000	0	100	100	14,200	7,500	21,700
South Dakota	6,800	100	0	300	7,200	2,000	9,200
Wisconsin	15,200	0	0	2,200	17,400	3,900	21,300
Totals	$98,400	$22,300	$1,500	$ 7,900	$130,100	$47,300	$177,400

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

***Does not include contributed services, Cooperative Rust Laboratory, valued at $4,200, and Rust Prevention Association, $34,000.

Barberry Eradication Expenditures by Source and by Activity - Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	$36,200	$16,000	$28,300	$321,200	$10,600	$800	$ 2,600	$415,700
Other Organizations:								
Illinois	0	0	0	900	0	0	0	900
Indiana	0	0	0	6,100	0	0	0	6,100
Iowa	0	0	0	4,500	0	0	2,400	6,900
Kansas	0	0	0	4,900	0	0	0	4,900
Michigan	0	0	0	39,400	0	0	1,600	41,000
Minnesota	0	0	0	18,200	0	0	1,300	19,500
Missouri	0	0	0	3,100	0	0	0	3,100
Nebraska	0	0	0	5,100	0	0	700	5,800
North Dakota	400	700	1,000	300	0	0	700	3,100
Ohio	0	0	0	14,000	0	0	200	14,200
South Dakota	700	1,000	2,500	2,600	0	0	400	7,200
Wisconsin	0	0	0	15,200	0	0	2,200	17,400
Subtotals	$ 1,100	$ 1,700	$ 3,500	$114,300	0	$ 0	$ 9,500	$130,100
CONTRIBUTED SERVICES**								
Illinois	500	2,000	0	0	1,500	0	0	4,000
Indiana	0	1,000	0	0	1,000	0	0	2,000
Iowa	100	4,000	500	0	1,100	0	0	5,700
Kansas	0	1,500	0	0	500	0	0	2,000
Michigan	0	1,300	200	0	4,200	0	0	5,700
Minnesota	200	800	200	3,800	2,300	0	0	7,300
Missouri	200	1,200	0	0	1,500	0	200	3,100
Nebraska	0	1,500	0	0	500	0	0	2,000
North Dakota	0	1,400	100	0	600	0	0	2,100
Ohio	2,000	2,100	400	0	3,000	0	0	7,500
South Dakota	100	1,000	500	0	400	0	0	2,000
Wisconsin	400	1,200	100	0	2,200	0	0	3,900
Subtotals	$ 3,500	$19,000	$ 2,000	$ 3,800	$18,800	$ 0	$ 200	$ 47,300
GRAND TOTALS	$40,800	$36,700	$33,800	$439,300	$29,400	$800	$12,300	$593,100***

*Direct approp., allotments other sources, services, & supplies for which there is a definite replacement value.
**Services incidental to other activities, for which only an estimated value is available.
***Does not include contributed services of Cooperative Rust Laboratory, valued at $4,200, and Rust Prevention Association, $34,000.

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I. Highlights of year's program activity

A. Accomplishments for fiscal year

Eradication of rust-spreading barberry bushes to protect cereal grains was somewhat intensified in Pennsylvania and the Virginias this year. Rework has continued in important areas and initial work was undertaken in new territory. Some territory was removed from active status on the basis of the second successive negative check. Efforts of all cooperating agencies resulted in the eradication of 2,842,950 rust-spreading barberries. To accomplish this eradication, crews intensively reworked 791 square miles of territory determined to be subject to reinfestation. In addition, initial work by farmstead and intensive methods was done on 1,209 square miles. Of the 1,800 square miles worked, 1,202 were placed on maintenance. As a result of accomplishments this year and in earlier years, stem rust was kept under control and small grain losses from this cause were negligible.

Federal and State quarantines were enforced throughout the year.

B. Major deviation from work plan

In Pennsylvania, additional manpower was provided by cooperating agencies. As a consequence, work was accomplished in three counties not originally included in work plans.

C. Status of program at close of year

At the end of fiscal year 1959, 32,238 of the 46,047 square miles scheduled for survey and eradication in the three eradication states, had been completed and placed in the maintenance category. In the remaining 13,809 square miles, initial work will be required on 7,883 and rework on 5,926. Refer to map and Table #2.

II. Program activity during fiscal year

A. Planning and direction

Work plans for program activities were developed jointly by officials of cooperating State and county agencies and PPC Supervisors.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel

Program personnel provided information to farmers and property owners on the importance of barberry eradication and encouraged

owners to undertake eradication of rust susceptible barberries growing on their properties. Descriptive literature was furnished to assist in identifying rust spreading barberries and to provide information on recommended methods of control.

2. Technical assistance provided to program by cooperating agencies

Plant Pathology and Extension specialists discussed barberry eradication at various county meetings in areas involved. They also informed program personnel of rust infestations observed or as reported to them. County agents assisted by distributing literature, advising the public of program undertakings in their counties, and in other public relations work.

C. Survey

1. Procedures or techniques used

a. Field

Two types of surveys are required as a part of an effective barberry eradication program. First, periodic checks on surveys are made to determine the type of work needed in various locations. Secondly, rust surveys are made throughout small grain growing areas during the rust season to record prevalence and severity of infestation and to make collections of infection for physiologic race studies.

Surveys are coupled to a degree with the actual eradication operation, bushes being destroyed as they are located. Barberries are located by systematic foot scouting of areas where bushes are most likely to be found.

b. Laboratory

Not applicable.

2. Accomplishments

Observations were made in all important small grain growing areas for occurrence and severity of rust infection. Collections of inspected material were taken and submitted to the Federal Rust Laboratory for race determinations. Rust infection was very light this year so good collections were hard to find.

In Pennsylvania, Race 7 constituted 100% of the infection found on oats, and Race 56 continued to be predominant on wheat, making up 33% of the races identified. Races 29 and the 17-29 group each constituted 20% of the races found. Race 48 of P. graminus tritiei was identified twice from aecial material submitted. See Table #4.

3. Statement or table of pest damage

Observations up to June 30, 1959, indicated another season of little damage from stem rust. Infestion, while present in most fields of wheat and oats, came too late to develop sufficiently to cause serious trouble.

Losses to stem rust in the three eradication states was estimated as follows:

	Wheat	Oats	Barley	Rye
Pennsylvania	Trace	Trace	Trace	Trace
Virginia	1%	15%	Trace	Trace
West Virginia	1%	5%	Trace	Trace

D. Eradication or Control

1. Procedures or techniques used

Eradication measures are designed to bring active areas to a maintenance status at the earliest possible time. Under this procedure, priority is given to rework requirements in order to prevent reinfestation of previously worked areas, and all additional resources are devoted to work in initial territory.

Initial or farmstead coverage entails the scouting of planting sites to locate and destroy introduced barberries from which new infestation may originate. When introduced plantings are found, a close intensive coverage of adjacent environs is made to locate and destroy any wild bushes stemming from such sources. Rework involved intensive type coverage which requires a close foot scouting of all uncultivated territory, subject to infestation. Infested areas are cleared by periodic inspections until no regrowth is found.

Eradication is accomplished by use of herbicides that have proved effective in killing Berberis. In areas of high bush populations, a hormone-type herbicide is applied as a basal spray to B. Vulgaris or as a foliage-basal spray to B. canadensis. In areas of scattered barberry growth, bushes are cut at the ground line and Ammonium Sulfamate (Ammate) is applied in dry salt form to the freshly cut stump surfaces.

2. Accomplishments

In Pennsylvania, 45,219 barberry bushes were eradicated by application of herbicides on 633 old and 199 new properties in 17 counties over a surveyed area of 1,419 square miles. A total of 78 properties were relegated to the inactive files and 799 square miles of territory were placed on maintenance.

In Virginia, a total of 937 properties were inspected and 2,384,950 bushes eradicated from 616 properties in 12 counties over a surveyed area of 524 square miles. A total of 224 properties were placed in the inactive files and 389 square miles of territory were placed on maintenance.

In West Virginia, 175 properties were inspected, and 458,000 bushes eradicated from 114 properties in four counties over a surveyed area of 57 square miles. A total of 41 properties were placed in the inactive files and 14 square miles of territory were placed on maintenance.

E. Regulatory

1. Procedures or techniques used

The Federal Black Stem Rust Quarantine (No. 38) regulates the interstate movement of all species and varieties of barberry, mahoberberis, and mahonia plants; and fruits and seeds. Only rust-resistant species and varieties as listed in administrative instructions may be shipped interstate under a certificate of inspection issued annually. Interstate shipments of rust-resistant fruit and seed require a special permit which must accompany the shipment. All nurseries and dealers engaged in interstate movement of regulated materials are inspected annually and issued certificates after determination that no plants other than rust-resistant are growing in the nursery or in its environs. If rust-susceptible plants are found, certificates are withheld until such plants are eliminated.

Parallelling State quarantines regulate the intrastate movement of rust spreading varieties of Berberris.

Post-entry barberry and mahonia being held under detention are inspected for trueness to type and proper labelling. Such stock is held until released by Plant Quarantine Division and State regulatory officials.

2. Accomplishments

During the fiscal year, 118 nurseries, 27 dealers, and three seed sources were inspected and issued certificates or permits authorizing the movement of regulated products.

F. Methods Improvement

Not applicable

G. Other

a. Cooperation received during fiscal year

a. Major contributions received

Cooperating State Departments of Agriculture actively participated in planning and direction of the work, provided funds, provided additional assistance in manpower, equipment, and supplies, and enforced State Quarantines.

In Pennsylvania, a number of County Commissioners appropriated funds for the eradication of barberries within confines of their counties. County agents assisted with local employment problems, arranged for publicity over radios, television and newspapers, and participated in discussions with county commissioners. Botany and Plant Pathology Departments and Experiment Stations of State Universities advised on technical problems related to susceptibility of varieties of small grains, made rust observations, and disseminated information.

b. Cooperative work needing strengthening another year

In Pennsylvania, at least two counties in important small grain producing areas, each having barberry problems, do not participate in the cooperative eradication program. Additional informational work in these counties is needed.

During the past three years, State funds have fallen short of matching available county funds in Pennsylvania. It is expected this situation will be rectified in the fall of 1959.

2. Associated activities and services

Stem rust control was discussed informally at 49 meetings with growers, university and high school classes, and other interested groups. News articles were prepared for use in several local newspapers in the eradication states. Exhibits were placed at six county fairs, at the annual meeting of the Virginia Nurserymen's Association, and at the Annual Flower Show in Washington, D. C.

III. Recommendations for coming year

A. Survey

Continue reconnaissance surveys to determine current status of infestation and need for rework.

Continue surveys to observe rust development, prevalence, severity, and damage. Collect and submit specimens of infected barberry and grain plants for race determination.

B. Eradication or control

Complete scheduled initial coverage as quickly as possible. Give priority to rework in areas that will require future coverage at timely intervals to preclude seed production on new growth and shorten rework intervals where possible.

C. Regulatory

Continue annual inspection of nurseries and dealers.

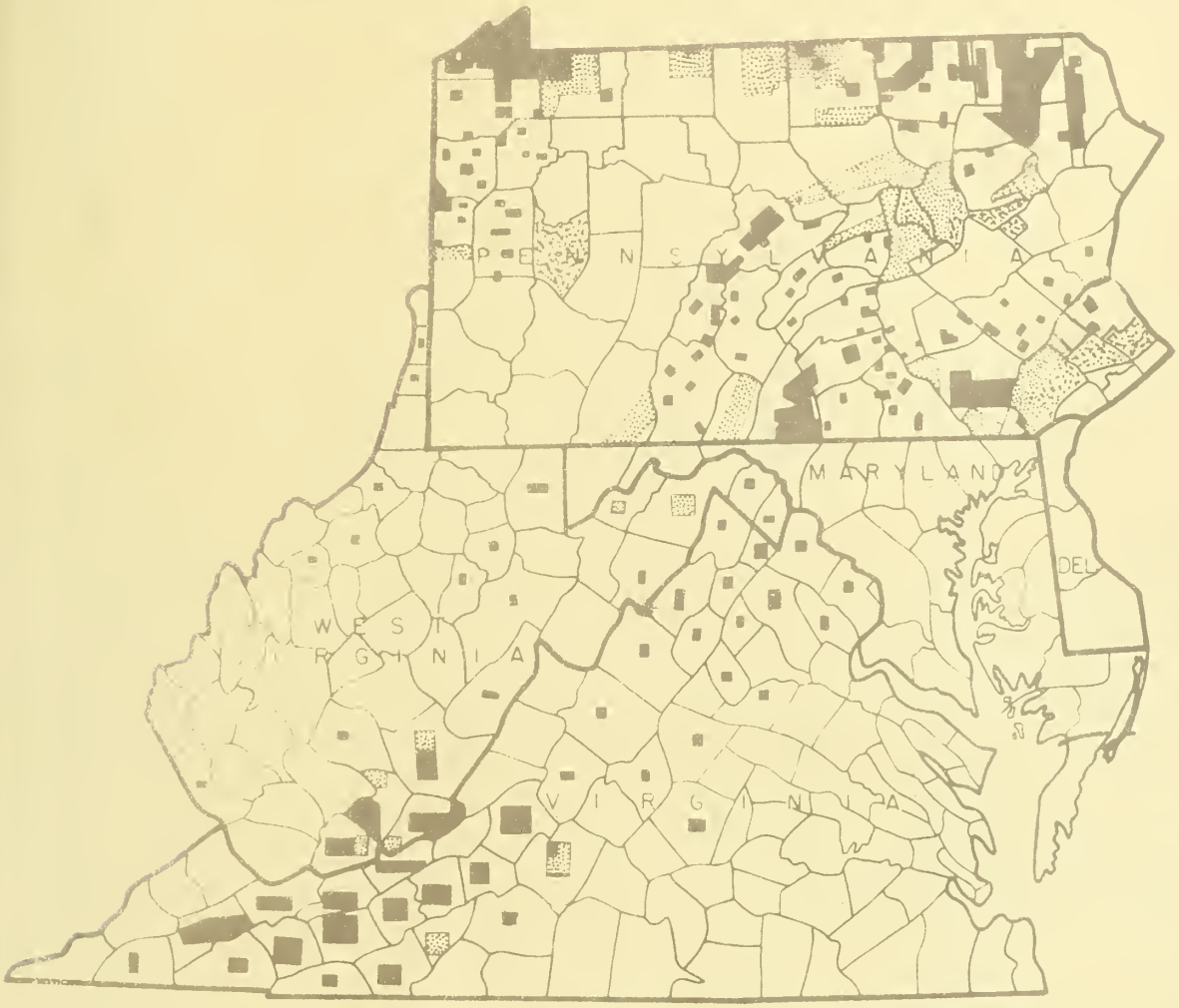
D. Methods Improvement

Continue screening tests of new herbicides as they become available and explore possible new or improved eradication procedures.

E. Associated activities

Continue stem-rust control discussions with farm and other local groups. Place exhibits at fairs and shows, prepare news articles for county agents to release in newspapers, and show the movie film and colored slides, whenever possible.

BARBERRY ERADICATION
EASTERN REGION
STATUS JULY 1, 1959



Area requiring intensive work 7,006 sq. miles.
Area requiring farmstead work 6,803 sq. miles.
Area on maintenance 32,238 sq. miles.

BARBERRY

EASTERN REGION

TABLE #1
FISCAL YEAR 1959

STATE A	SQUARE MILES WORKED		PROPERTIES FOUND INFESTED		OLD PROPERTIES INSPECTED	BARBERRY BUSHES DESTROYED		INSPECTIONS	
	Initial B	Rework C	New D	Old E	F	Common G	Native H	Nursery I	Dealer J
Connecticut	-	-	-	-	-	-	-	9	1
Delaware	-	-	-	-	-	-	-	8	-
Maryland	-	-	-	-	-	-	-	8	2
Massachusetts	-	-	-	-	-	-	-	4	-
New Jersey	-	-	-	-	-	-	-	20	4
New York	-	-	-	-	-	-	-	20	13
Pennsylvania	902	517	199	633	1545	45219	-	23	4
Rhode Island	-	-	-	-	-	-	-	5	-
Virginia	305	219	46	570	891	-	2384950	16	1
West Virginia	2	55	4	114	175	-	458000	4	-
Washington, D. C.	-	-	-	-	-	-	-	1	2
Total	1209	791	249	1317	2611	45219	2842950	118	27
Total from beginning of Program	38164	12883	19513	18154	36246	15420565	404846606		

On December and June reports show: Square miles placed on maintenance since July 1, 1,202; since beginning of program 32,093; properties made inactive 2,480.

PPC 7-1

TABLE #2

BARBERRY ERADICATION

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1934-1959

EASTERN REGION

FISCAL YEAR 1959

State	SQUARE MILES									
	Total in State to be Worked	Number Covered				Number Requiring Work One or More Times				Number Requiring No Future Work
		Initial Work		Rework		Farmstead		Intensive		
		Farm-stead	Inten-sive	Farm-stead	Inten-sive	Initial	Rework	Initial	Rework	
Pennsylvania	27,834	11,086	10,029	0	6,798	6,454	0	265	4,277	16,838
Virginia	12,532	8,325	3,154	10	4,095	232	0	821	1,098	10,381
W. Virginia	5,681	3,529	2,041	143	1,837	0	117	111	434	5,019
Totals	46,047	22,940	15,224	153	12,730	6,686	117	1,197	5,809	32,238

State	Properties			Barberries Destroyed to Date
	Total Found to Date	No. Needing One or More Reinspections	Number Completed	
Pennsylvania	12,236	11,304	932	15,374,706
Virginia	5,026	3,662	1,364	224,501,608
W. Virginia	2,251	2,061	190	180,390,857
Totals	19,513	17,027	2,486	420,267,171

TABLE #3

SUMMARY OF ASSOCIATED ACTIVITIES

EASTERN REGION

Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories	Extent these Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest.Maps & Posters	
Pennsylvania	1	32	20	32	-	1	4	6	2000	-	30	1
Virginia	-	12	-	14	-	-	-	2	125	1025	20	-
West Virginia	-	5	-	12	-	-	1	-	45	175	25	1
Totals	1	49	20	58	-	1	5	8	2170	1200	75	1

TABLE #4

Physiologic Race Identification

Pennsylvania

Date	Host	Town	County	Race	Collector
			P. graminis tritici		
6/4	B.vulgaris	Waterford	Erie	11	Malyuk 553
6/24	B.vulgaris	Waterford	Erie	48	Maxwell
6/28	Thorne	Ronks	Lancaster	17-29 gr	Campbell #3
7/2	B.vulgaris	Greenfield Twp.	Lackawanna	48	Hull,Kolenda 206
7/7	*Quack gr.	Coudersport	Potter	111	Keim 461
7/7	Wheat	Wyalusing	Bradford	56,29,48A	Mulderig 89
7/8	Wheat	Athens	Bradford	56	Mulderig 90
7/23	Wheat	Ridgebury	Bradford	11,29	Gates 1000
7/25	Wheat	Smithfield	Bradford	17-29 gr,56	Gates 1001
			P. graminis avenae		
7/15	Oats	Albion	Erie	7	Maxwell 502
8/4	Orchard grass	Oregon	Wayne	7	Sporer 102
			P. graminis secalis		
5/19	B.vulgaris	Waterford	Erie	--	Sherred PA 576
5/28	B.vulgaris	Athens	Bradford	--	Mulderig 79
6/4	B.vulgaris	Sterling Twp.	Wayne	--	Mulderig

* Direct barberry spread

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

BARBERRY

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for the fiscal year

In the Southern Region, the only work on barberry eradication consisted of inspection of nurseries or dealers that grow or handle ornamental barberry or mahonia for interstate shipment; the object of the inspection being to make sure that all plants entering the nursery trade are of species that have been proven resistant to black stem rust.

During the fiscal year, inspections were made of 108 nurseries and 12 dealers in the 11 states of the Southern Region.

B. Major Deviation from Work Plan, if any

None.

C. Status of Program at close of year

All nurseries known to ship barberries interstate have been inspected.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

Applications for inspection are received in the Regional Office each season. These are sent to the appropriate Supervisor in Charge together with an inventory of plants inspected the previous season. The actual inspection is made by a Federal Inspector in each state, accompanied by the State Nursery Inspector if possible.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Not applicable.

2. Technical assistance provided to program by cooperating agencies

Nurserymen destroy rust susceptible plants when found in nurseries. The State Nursery Inspectors assist by visiting the nurserymen with the Federal Inspector.

C. Survey

1. Procedures or Techniques used

a. Field

All blocks of nursery stock containing barberries or mahonia are examined, and any suspected plants are removed. Inspection of seedlings is made after the second growing season in the nursery.

b. Laboratory

None.

2. Accomplishments

All nurseries inspected were found to be handling only approved species of barberry and mahonia.

3. Statement or table of pest damage

Some species of barberries and mahonia serve as alternate hosts of black stem rust of wheat.

D. Eradication or Control

1. Procedures or Techniques used

No eradication work was done in the Southern Region.

2. Accomplishments

None.

E. Regulatory

1. Procedures and Techniques used

Following inspection, a certificate is issued to each qualified nursery stating that only approved species of barberry or mahonia are handled.

2. Accomplishments

All nurseries met the necessary requirements and were certified.

F. Methods Improvement

1. Work Performed

None.

2. Accomplishments

None.

G. Other

1. Cooperation received during fiscal year

a. Major contributions

State Nursery Inspectors in each state assisted in making the inspections.

b. Cooperative work needing strengthening.

None.

III. Recommendations for Coming Year

A. Survey

Several inspectors in each state should be trained to make these inspections in order to better distribute the work load.

B. Eradication and Control

None.

C. Regulatory

None.

D. Methods Improvement

None.

E. Associated Activities

None.

BARBERRY ERADICATION

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

BARBERRY ERADICATION

July 1, 1958 - June 30, 1959

In cooperation with
County, State, Federal, and Local Agencies

December 1, 1959

Oakland, California

Jim R. Dutton

Regional Supervisor

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HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

Surveys and eradication were conducted during the fiscal year as follows:

Barberry areas were reworked in the Colorado Counties of Archuleta, Boulder, El Paso, La Plata, Larimer, Las Animas, Montezuma, and Montrose. In these counties 195 square miles were worked, of which 79 square miles were placed on maintenance and 152 properties were made inactive.

In Montana, 24 square miles were intensively resurveyed for the second or third time, leaving 59 square miles to be covered. Eight large escape bushes were found and destroyed on two new properties. These bushes were found as a result of extending the surveys a greater distance from locations where bushes were previously found. Escape bushes were found on eight old properties. One bush was found on an old property in Flathead County on which escape bushes had not been found following the removal of the original plants. In Washington, work was conducted in the Counties of Benton, Douglas, Franklin, Grant, Stevens, and Whitman. The survey conducted in the first five counties named was the first rework following the initial survey. The rework principally involved the rechecking of old barberry locations and environs. Due to stem rust incidence in Stevens County, the intensive survey work was extended into native brush and timbered areas and encompassed considerable additional territory. This resulted in finding new barberry locations in remote territory. In Whitman County the second rework survey was completed. A total of 313 barberry bushes was destroyed on 22 old and 52 new properties during the reworking of 69 square miles of territory.

In Wyoming, limited observations were made during the year and no susceptible bushes were observed.

Major Deviation from Work Plan

There were no major deviations from the work plan.

Status of Program at Close of Year

Most of the work remaining in Colorado is rework in the native barberry areas in the southwestern portion of the State. It will require several years' work before all properties in this area can be considered negative.

All survey work planned for the year in Montana was accomplished. There remain 59 square miles to be covered. Idaho's program consisted of stem rust surveys to determine presence of stem rust in the State.

In Washington all the planned rework activity in the various counties was completed.

Since no barberry bushes were found in Wyoming, there was no change in the status of the work in the State.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

Plant Pest Control Division personnel coordinate all the activities of the cooperative program; handle field direction of survey and eradication; work with State inspectors on nursery inspection, giving special attention to interstate barberry shipments; conduct seasonal stem rust surveys; engage in field tests of herbicides; and develop other direct field operational phases of the program. Work plans for barberry activities in each state were prepared in collaboration with the State Departments of Agriculture and other principal cooperators.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Systematic barberry survey and eradication work in infected areas was handled almost entirely by program personnel. Technical assistance was provided to farmers and others by program personnel. Barberry and rusted grain specimens submitted by University Extension and State personnel, farmers, and others were identified, and a general flow of information on this and other program activities was released to the public through the cooperators.

Technical assistance provided to program by cooperating agencies

Technical assistance received from the State, State University, Experiment Station, and Extension Service

principally consisted of direct work with the public, such as initial identification of barberry, rust, survey situations, and related matters. These agencies also supplied various types of technical information as required; collaborated in the preparation of pamphlets, news articles, and similar program service items; and in general, served in a consultive and advisory capacity for the numerous program activities.

Survey

Procedures or techniques used

Field

In the eradication areas, all native and planted barberry are closely inspected by crews walking over the area to look for bushes. The time devoted to each area depends on the extent of terrain and vegetation present. Bushes, when found, are either removed or chemically treated.

Laboratory

No field laboratories are maintained.

Accomplishments

In the States of Colorado, Montana, and Washington, where cooperative active barberry eradication is in progress, a total of 296.5 square miles was worked, and 433,829 barberry bushes were destroyed.

Stem rust surveys - During the 1959 fiscal year, stem rust and leaf rust were very light over the entire State of Colorado. The Plant Pathology Department of the University of Idaho assisted in sampling wheat fields and grain fields for presence of stem rust. Two stations were established in Idaho to check wind-carried spores. Ten northern Idaho Counties were spot-checked for stem rust. Comprehensive stem rust surveys were conducted throughout principal crop areas in eastern Washington. Also, several stem rust survey trips were made in northeastern Oregon. Grain fields in all sections of Montana were checked throughout the growing season for the presence of stem rust. Extremely dry weather in that State may have been responsible for the non-occurrence of rust.

Statement of crop losses

There were no losses due to stem rust in Colorado during the fiscal year 1959. Estimated wheat loss due to stem rust by counties in Idaho is as follows: Kootenai, Bonner, Boundary, Benewah, Nez Perce, Idaho, and Clearwater - trace; Latah County - 1 percent; Lewis County - 0.5 percent.

The general incidence of stem rust during 1958 in southeastern Washington, northeastern Oregon, and northern Idaho was virtually a repetition of the 1957 situation. In 1958, however, there was an earlier and more abundant development of stem rust on barberry, especially in northeastern Oregon, which subsequently developed generally in the immature grain. The spread of the spores by wind currents to crops in Baker, Union, and Wallowa Counties, Oregon was early and heavy. Barberry bushes in northern Idaho were also moderately infected, but the early spread to grain was not so noticeable. Idaho crops were seriously affected north of the Salmon River to Benewah County. The northerly spread from Oregon blanketed southeastern Washington, extending west to the Columbia Basin and north to Grant and Spokane Counties, Washington. Total crop losses from stem rust in the three States has been variously and unofficially estimated at between 2 and 4 million dollars for the 1958 season.

Eradication or Control

Procedures or techniques used

There was no deviation from general program eradication procedures.

Accomplishments

In barberry work the survey and eradication procedures with respect to common barberry are carried on as parallel and essentially coincidental activities. The overall accomplishments are given under the general heading "Survey."

Regulatory

Procedures or techniques used

There was no deviation from general program regulatory procedure.

Accomplishments

Nursery inspection was in cooperation with the State nursery or regulatory officials in the States of California, Colorado, Montana, Oregon, Utah, and Washington. In the following table these cooperative inspections are summarized for the inspection season:

Summary Barberry Nursery Inspection-1959 Field Season
Number Inspected, Nurseries, Dealer, Barberry and Mahonia Bushes

State	Nurseries	Dlrs.	B. thun.	B. thun. Atro.	Other B.thun.	Other B.	Mahonia	Total
Calif.	13	0	2	33,712	5,833	48,675	126,068	214,290
Colo.	5	0	1,570			50	911	2,531
Montana	3	0	50				27	77
Oregon	34	2	6,124	11,636	5,723	62,271	653,841	739,575
Utah	2	0		2,987		565	749	4,301
Wash.	23	1	4,238	12,626	2,796	15,904	1,461,814	1,497,378
Totals	80	3	11,984	60,961	14,352	127,465	2,243,410	2,458,172

In addition to the above nurseries and dealers, there is one seed shipper in the Western Region who collects and sells Mahonia seed. The seed is from approved native sources.

In December 1958 three shipments were intercepted by State Horticultural Inspectors at Billings, Montana because the barberry bushes were improperly labeled.

Methods Improvement

Work performed

None

Accomplishments

None

Other

Cooperation received during fiscal year

The State Departments of Agriculture participated in all of the activities of the program and provided the

major share of cooperator funds. The Experiment Stations and State Extension Services assisted greatly in program service and provided some or all of the office, storage, greenhouse, and laboratory space; supplies; and technical information. Some counties furnished funds, labor, equipment, and supplies for work in their areas. Invaluable aid is received each year from the Rust Prevention Association, Minneapolis, Minnesota, which promotes barberry eradication and stem rust control on a broad basis throughout the United States.

Associated activities and services

Program servicing

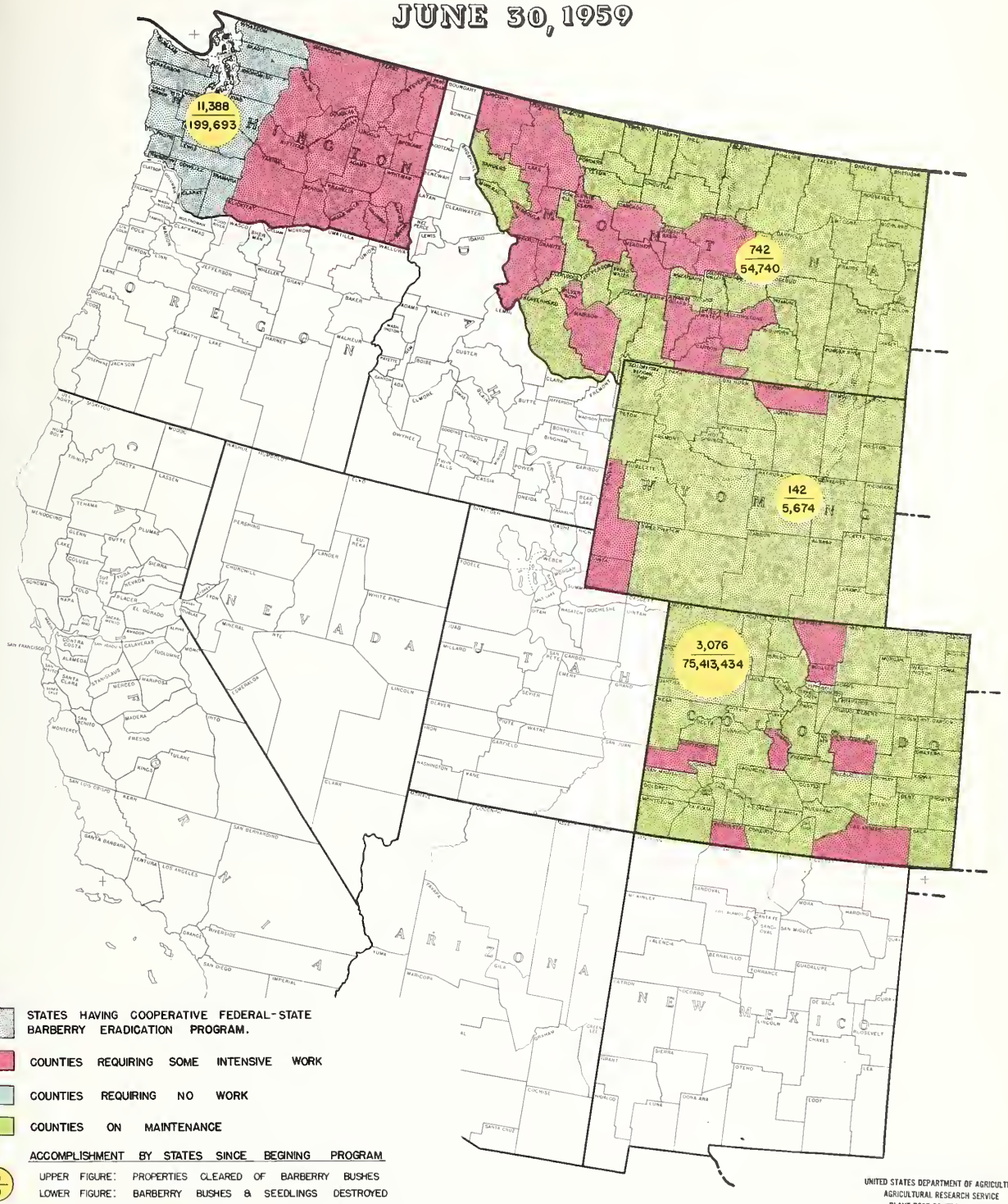
Because program employees are in contact with property owners, dissemination of accurate information is an important responsibility of personnel doing barberry eradication. During the year, in collaboration with the State Departments of Agriculture and the Extension Service, program personnel participated in the following: 5 informal talks, 6 showings of films, 1 showing of slides, 2 radio appearances, 20 feature and news stories, and 1 exhibit. In addition, 25 bulletins and 1,500 circulars were distributed, and 6 special reports were prepared.

RECOMMENDATIONS FOR COMING YEAR

In fiscal year 1960, we propose to follow the same proven procedures as in the past.

BARBERRY ERADICATION

JUNE 30, 1959



STATES HAVING COOPERATIVE FEDERAL-STATE BARBERRY ERADICATION PROGRAM.

COUNTIES REQUIRING SOME INTENSIVE WORK

COUNTIES REQUIRING NO WORK

COUNTIES ON MAINTENANCE

ACCOMPLISHMENT BY STATES SINCE BEGINING PROGRAM

0/0 UPPER FIGURE: PROPERTIES CLEARED OF BARBERRY BUSHES
LOWER FIGURE: BARBERRY BUSHES & SEEDLINGS DESTROYED

SUMMARY ACCOMPLISHMENTS ALL STATES WESTERN REGION

PROPERTIES CLEARED — — — — — 15,348

BUSHES & SEEDLINGS DESTROYED — — 75,673,541

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 1959

GPO 979434

PROPERTIES CLEARED AND BARBERRY BUSHES DESTROYED

Barberry Eradication

Fiscal Year 1959

State	Square Miles Worked		Properties Found Infested		Old Properties Inspected	Bushes Destroyed		Inspections	
	Initial	Rework	New	Old		Common	Native	Nursery*	Dealer*
California	0	0	0	0	0	0	0	13	0
Colorado	0	195	1	170	280	41	433,454	5	0
Montana	9	24	2	8	162	21	0	3	1**
Oregon	0	0	0	0	0	0	0	34	2
Utah	0	0	0	0	0	0	0	2	0
Washington	21	48	52	22	324	313	0	23	1
Wyoming	0	0	0	0	0	0	0	0	0
Totals	30	267	55	200	766	375	433,454	80	4

* 1959 Season
** Seed Dealer

SUMMARY OF ASSOCIATED ACTIVITIES

Barberry Eradication

Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Circ.*	Infest.Maps & Posters	
Colorado	2	3	1	1	0	0	0	0	0	0	0	0
Montana	1	1	0	0	0	0	0	0	0	0	0	0
Washington	1	1	0	5	2	0	20	1	25	500	0	6
Total	4	5	1	6	2	0	20	1	25	500	0	6

* Written by Federal personnel for release direct or through cooperators.

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1918 - 1959

Barberry Eradication — Fiscal Year 1959

STATE	SQUARE MILES										PROPERTIES			BARBERRY BUSHES DESTROYED		
	Total in State to be Worked	Number Covered				Number Requiring Work One or More Times				Number Requiring No Future Work	Total Found To Date	Number Needing One or More Reinspections	Number Completed	Common	Native	Total
		Initial Work		Rework		Farm-stead		Intensive								
		Farm-stead	Inten-sive	Farm-stead	Inten-sive	Initial	Rework	Initial	Rework							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Colo.	74,685	74,036	5,600	9,148	4,987	0	0	0	57	74,628	3,076	387	2,689	102,162	75,413,434	75,515,596
Mont.	146,316	146,316	426	6,044	730	0	0	0	59	146,257	742	95	647	54,740	0	54,740
Wash.	29,872	29,872	2,563	177	1,669	0	20	100	816	28,936	11,388	11,066	322	199,693	0	199,693
Wyo.	94,487	94,487	558	7,367	1,267	0	0	0	10	94,477	142	21	121	5,674	0	5,674
TOTALS	345,360	344,711	9,147	22,736	8,653	0	20	100	942	344,298	15,348	11,569	3,779	362,269	75,413,434	75,775,703

Barberry Eradication EXPENDITURES BY SOURCE AND ACTIVITY Fiscal Year 1959

	1	2	3	4	5	6	7	8
Source of Cash & Equivalent*	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
Plant Pest Control Division	$ 31,880	$ 3,400	$ 38,200	$ 6,700	$ 2,420	$ 100		$ 82,700
Other Organizations (Name)								
State Depts. of Agriculture	100		6,500	6,500				13,100
Washington Counties			717	240				957
Subtotal Other Organizations	100		7,217	6,740				14,057
Total (of PPC & Other)	31,980	3,400	45,417	13,440	2,420	100		96,757
Contributed Services**								
State Depts. of Agriculture		1,250			4,500			5,750
Exp. Stations & Ext. Svcs.		2,000						2,000
Washington St. Univ., et al				100				100
Total		3,250		100	4,500			7,850
Grand Total	$ 31,980	$ 6,650	$ 45,417	$ 13,540	$ 6,920	$ 100		$ 104,607

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

COOPERATIVE AID RECEIVED

Barberry Eradication

Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
	$	$	$	$	$	$	$	
State Depts. of Agriculture								
California						1,000	1,000	
Colorado		3,500			3,500	1,500	5,000	
Montana		2,100			2,100	750	2,850	
Washington		7,500			7,500	2,500	10,000	
Counties								
Stevens, Wash.		752			752		752	
Whitman, Wash.		205			205		205	
Exp. Stations & Exten. Services						2,000	2,000	
Washington State University, et al						100	100	
Total	$	$14,057	$	$	$ 14,057	$ 7,850	$ 21,907	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

GPO 979546

* --- *

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

BURROWING NEMATODE

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

1. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During fiscal year 1959, burrowing nematode work carried on by Plant Pest Control Division personnel was concentrated principally on margin inspections of previously pushed and treated areas, delimiting extensions of such areas, and nursery inspections. Plant Pest Control Division personnel did very little detection survey in groves except in areas where clean-up was accomplished. However, State Plant Board personnel conducted considerable detection survey, and it is significant to report that although a good number of groves were found positive for the first time, no additional large areas of decline were discovered.

Nursery site approval was in operation during the entire year, and several nurserymen were saved considerable expense by having sites rejected before planting rather than discovering their nursery was infested after the expense of planting and budding.

To improve survey and laboratory techniques was a constant objective throughout the year. Reviews of old records to discover any trend that might exist to improve survey techniques, and recording additional information for the same purpose were expanded. Any new information from research was implemented under field conditions as quickly as possible, and equipment modifications based on research findings were introduced where practical under field conditions.

B. Major deviation from Work Plan, if any

Court interpretations of the power of the Plant Board to execute certain phases of the program, as intended by the Florida Legislature, forced modifications in the program as planned until these entanglements could be determined. Forced area clean-up attempts were discontinued, and Plant Pest Control Division personnel was reduced at the beginning of the fiscal year to conform to a reduced workload.

C. Status of Program at close of year

A ruling by the Florida Supreme Court in March made it necessary to completely revise the program. In light of this ruling, Members of the Division, State Plant Board, Research and Industry personnel drew up a new program that would accomplish the objective of eradication in commercial groves with a minimum outlay of compensation for trees pushed. This revised program was

approved, and the Legislature passed the Burrowing Nematode Bill before adjournment in early June. The new program had not been inaugurated at the close of the fiscal year.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

The composite thinking of personnel from Research, Plant Pest Control Division, State Plant Board, and leaders representing the citrus industry helped in making plans for the over-all program. The State Plant Board directed the control and regulatory activities, and the Plant Pest Control Division conducted the survey and identification phases of the program.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Through talks, visual aids, exhibits, circular distribution, and personal contacts, growers and nurserymen were made cognizant of the hazards of spread of burrowing nematodes connected with cultural practices, dirt movement, and replanting with uncertified trees.

2. Technical assistance provided to program by cooperating agencies

Research facts are made available for use by those directing the program by both the Federal and State research agencies at any time new discoveries indicate a change might be in order for improvement of any phase of the program.

C. Survey

1. Procedures or techniques used

a. Field

Visual symptoms of decline in groves are checked to determine the presence of burrowing nematodes. Where positive finds are made, the area is then mapped to determine the visual periphery of the infestation. The third row out from the visual periphery is completely sampled, and all positive finds are then checked out at least two negative trees beyond these finds. Scattered samples are taken throughout the remainder of the grove.

Nursery sampling is ordinarily confined to sampling by the grid method, since visual symptoms are not evident in trees under ten years of age.

b. Laboratory

Root samples are washed to remove dirt and debris from the samples to prevent interference with nematode recovery. They are then placed in moist chambers and incubated for a minimum of 48 hours before reading. During the year, upon recommendation from research, a change was made whereby a 2 percent solution of hydrogen peroxide was flushed over the roots after washing to add oxygen to the chambers during incubation, resulting in a higher percentage of nematodes emerging from the roots. After incubation the sample is washed with low water pressure and screened. The screenings are transferred to a Syracuse dish for examination under a microscope.

2. Accomplishments

During fiscal year 1959, 859 citrus groves, representing 18,280 acres, were surveyed. New infestations were discovered in 104 groves. However, only 188 acres of decline was determined for these groves, indicating that all large areas of decline have been discovered. Infestations in 118 groves, containing 312 infested acres and 500 acres of extensions to previously pushed and treated areas, were delimited. A survey was made of 939 nurseries. A total of 46 citrus nurseries, consisting of approximately 8 acres, and 24 ornamental nurseries, representing almost 7 acres, was found positive for the burrowing nematode for the first time.

The laboratory processed a total of 88,466 root samples of which 3,731 were found positive. During the year, six new men were trained for identification work in the laboratory. However, during this same time eight men resigned, two were reassigned, and two were transferred to other states, resulting in a net loss of six men to the laboratory staff.

3. Statement or table of pest damage

Burrowing nematode damage ranges from only a trace in newly infested groves to almost 100 percent in areas infested for several years. Other factors, such as weather and care of the grove, also affect degree of damage from year to year.

Damage was relatively light in contrast to the total acres infested during the past year because most of the heavily

infested groves had been pushed under the volunteer phase of the program.

D. Eradication or Control

1. Procedures or techniques used

Eradication treatments were applied by the State Plant Board of Florida which consisted essentially of the removal of the diseased trees and trees along the margin of the infested area, the fumigation of the soil with DD, the prohibition of replanting in the treated area for two years following treatment,and maintenance by the grower of clean cultivation for a minimum of six months after the pushing and treating had been accomplished.

2. Accomplishments

The State Plant Board pushed and treated approximately 800 acres of grove land for citrus decline due to burrowing nematodes. Nursery treatments were extended to include a total of 96 nurseries during the fiscal year.

E. Regulatory

1. Procedures or techniques used

Regulatory activity is a responsibility of the State Plant Board. Since inauguration of nursery site approval in February 1958, the Plant Board has required approval of all nursery sites prior to planting. Nurseries planted prior to that date are required to "hot water treat" all stock before moving into commercial grove areas. Infested ornamental nurseries are prohibited from moving stock into commercial citrus areas.

2. Accomplishments

A total of 946 citrus nursery sites was approved by the Plant Board. Several hundred sites were rejected in the field by Plant Board inspectors, and six were rejected because burrowing nematodes were found either on the site or too close on the environs.

During the year, 93,102 citrus trees were "hot water treated" to meet certification requirements.

F. Methods Improvement

1. Work Performed

Methods Improvement furnishes technical assistance on the various programs carried on within a given area in implementing equipment modifications as indicated from research for program improvement.

2. Accomplishments

Research revealed that a certain percentage of trees could be established as positive for burrowing nematode only at a greater depth than was possible with augers presently used. No commercial augers were available that would collect samples at a greater depth than those in use. Near the end of the fiscal year, Methods Improvement built an auger superior in every respect to those now in use. This auger will collect samples 12 to 18 inches deeper than those presently used and lifts the load with less strain on the vehicle.

G. Other

1. Cooperation received during fiscal year

a. List major contributions received and show importance to program (Other than funds).

The greatest single contribution to the program involved the installation and maintenance of barriers at the growers' expense to slow down the migration of burrowing nematodes. Some push and treat was carried on at the growers' expense when they failed to qualify under the limited Plant Board program. Growers also furnished a small amount of manpower for the collection of samples. In addition, growers went to considerable expense in maintaining pushed areas free of vegetation during the first six months following fumigation. Some contributions were received from local governments in the form of free rentals for office and storage space. The Industry Spreading Decline and Research Committees furnished a great deal of technical aid. In addition, the Industry Spreading Decline Committee furnished legal counsel to the Plant Board to help expedite their fight through the courts.

b. Cooperative work needing strengthening another year

The problem of maintaining clean cultivation after fumigation needs to be strengthened. This phase of the program has been weak from the beginning. Every consideration should be given to making application of residual herbicides following fumigation, unless greater cooperation can be assured than has been the record in the past.

2. Associated activities and services

Not applicable

III. Recommendations for coming year

A. Survey

With adoption of the new program, as drawn up by State Plant Board and Plant Pest Control Division personnel assisted by Research and advisors from the Citrus Industry, it is recommended that the Division continue to be responsible for all survey activity with the exception of the part for which a fee is charged; namely, inspections as a basis for real estate transactions.

B. Eradication or Control

It is recommended that positive steps be taken to assure that areas pushed and treated remain free of vegetation for a period of at least six months. This should be made a responsibility of those directing the program and funds provided for application of herbicides if necessary.

C. Regulatory

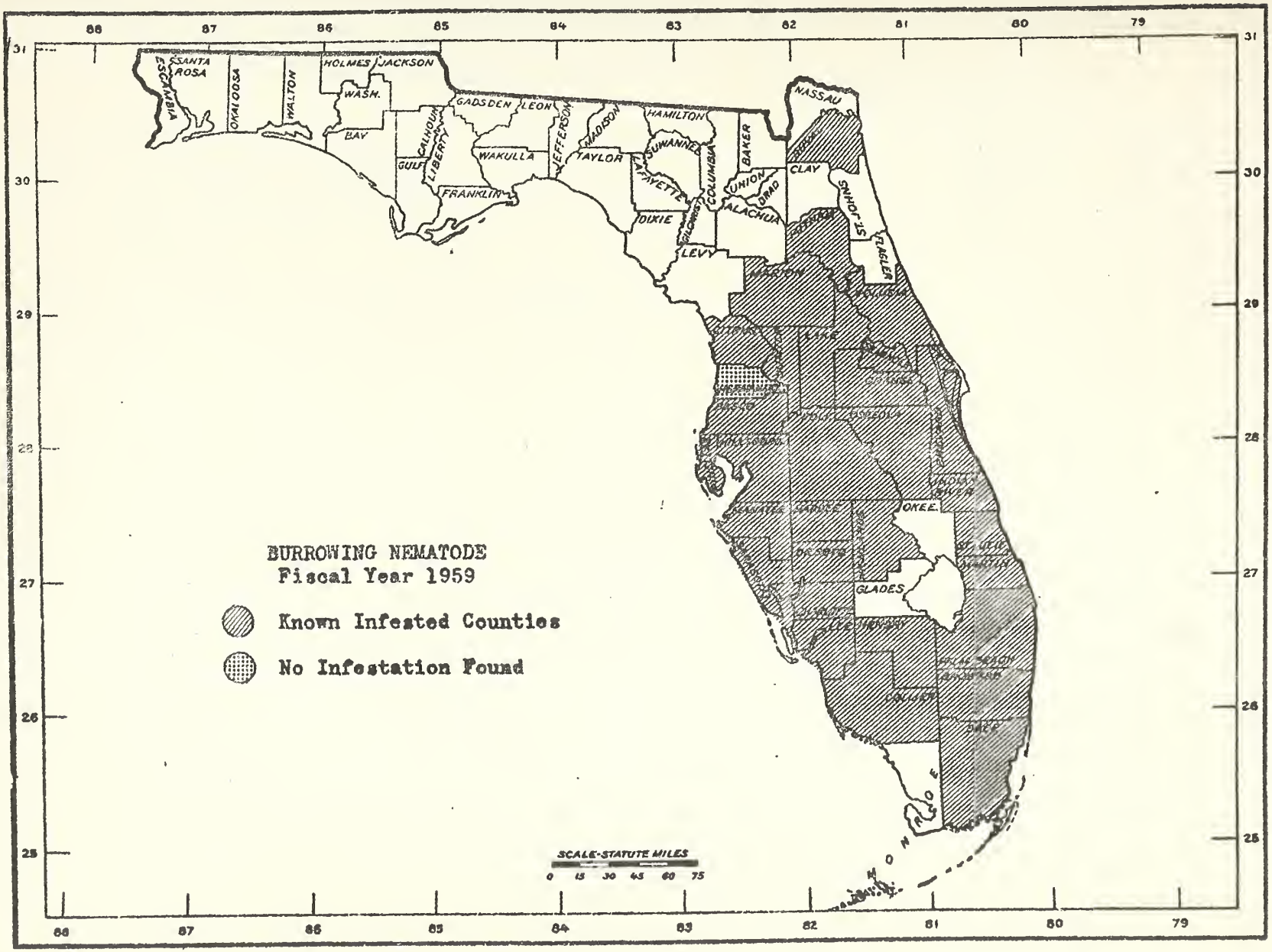
It is recommended that regulations of cultivation equipment be made a part of the burrowing nematode quarantines.

D. Methods Improvement

The unit has demonstrated its worth on many occasions in the past, and it is recommended that activity here be maintained and strengthened if need be in order to function with as little encumbrance as possible.

E. Associated Activities

This phase of the program needs strengthening, and plans are to step up activities in this regard, especially with inauguration of the new program, in order for the growers as well as the public to fully understand program objectives. County Committees should be formed.


BURROWING NEMATODE
Fiscal Year 1959
Known Infested Counties
No Infestation Found
SCALE-STATUTE MILES
0 15 30 45 60 75
ESCAMBIA
SANTA ROSA
OKALOOSA
WALTON
HOLMES
JACKSON
WASH.
BAY
GULF
CALHOUN
LIBERTY
FRANKLIN
GADSDEN
LEON
WAKULLA
JEFFERSON
MADISON
TAYLOR
HAMILTON
SUWANNEE
LAFAYETTE
DIXIE
COLUMBIA
BAKER
NASSAU
DUVAL
CLAY
UNION
ALACHUA
LEVY
ST. JOHNS
FLAGLER
VOLUSIA
LAKE
ORANGE
OSCEOLA
POLK
HILLSBOROUGH
PASCO
MANATEE
SARASOTA
DESOTO
HARDEE
HIGHLANDS
OKEE.
INDIAN RIVER
ST. LUCIE
MARTIN
GLADES
COLLIER
DADE
MONROE

BURROWING NEMATODE

Region: Southern

Prepared by:

Period (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1959

Date Prepared:

STATE AND COUNTY	SURVEY					CONTROL		
	Detection			Delimitation				
	Groves Inspected	Nurseries & Greenhouses Inspected	Acres Inspected	Properties Inspected	Acres Inspected	Nurseries and Greenhouses Treated	Groves Treated	Total Acres Treated
A	B	C	D	E	F	G	H	I
Florida	859	939	18,280.09	118	312.43	96	85	823.93
Total This Period								
Total From July 1	859	939	18,280.09	118	312.43	96	85	823.93
Total From Beginning of Program	7,961	7,048	130,241.48	800	4,337.18	161	645	5,008.59

Report: Total counties infested to date:

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

BURROWING NEMATODE

Region: Southern

Prepared by:

Period *(Designate: Month, 1-15, 16-31, or 1-31)*: Fiscal Year 1959

Date prepared:

STATE AND COUNTY A	NEW INFESTATIONS		CLASSIFICATION OF INFESTED PROPERTIES							
	All Properties B	Total Acres C	Citrus Groves		Citrus Nurseries		Ornamental Nurseries		All Other	
			Number D	Acres E	Number F	Acres G	Number H	Acres I	Number J	Acres K
Florida	183	205.91	104	188.10	46	8.11	24	6.70	9	3.00
Total This Period										
Total From July 1	183	205.91	104	188.10	46	8.11	24	6.70	9	3.00
Total From Beginning of Program	2,210	11,038.82	1,458	9,036.35	331	477.43	259	1,286.16	162	238.88

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Burrowing Nematode — SUMMARY OF ASSOCIATED ACTIVITIES — Prepared by: G. G. Rohwer

Region Southern — Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
IV, Florida	6		5				648	1		900	1	
Total	6		5				648	1		900	1	

- - -

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

CHINCH BUG

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

December 7, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highllghts of Year's Program Activity

A. Accomplishments for the fiscal year

Hibernation surveys were made in 17 Arkansas counties and in 50 Oklahoma counties, and indicated degrees of infestation in the several counties found infested are shown on the accompanying map. "Follow-up" surveys were made in the spring and summer of 1959, but in the absence of a suitable rating system for plotting infestations at this time of the year, an infestation map was not prepared.

B. Major deviation from work plan

Surveys were delayed for one month because of the late arrival of sufficient cold to force the chinch bug into hibernation.

C. Status of program at close of year

Infestations were generally lower than those found the previous year, but "very severe" infestations were indicated for 4 counties in Arkansas and 3 counties in Oklahoma. Infestations in local areas of the other counties ranged from "light" to "severe."

II. Program Activity during fiscal year

A. Planning and direction

Planning and direction of surveys were accomplished by the Plant Pest Control Division Supervisor in Charge, in cooperation with the State Entomologist, Survey Entomologist, and Plant Pest Control Division personnel.

B. Technical assistance

Assistance was given to farmers and county agents by means of notices of infestations and personal contacts. Additional help was provided these groups in matters concerning the control of the chinch bug and the proper procedures, dosages, etc., required to prevent damage to growing crops by this pest.

C. Survey

In addition to the 335 stops made in the 67-county area during the hibernation survey, 30 stops were made during the spring months. This follow-up survey, as previously stated, was intended to provide comparative information on winter-surviving and summer populations, but due to the extremely wide variations in the stage of plant growth, no uniform rating system could be found.

D. Eradication or control

Control of the chinch bug in Arkansas and Oklahoma is based on the use of insecticides and it is a voluntary undertaking.

E. Regulatory

Not applicable.

F. Methods Improvement

None.

III. Recommendations for the coming year

A. Survey

A very definite need exists for a system of rating chinch bug populations on growing plants. Several systems were tried in making population counts, but apparently none was suitable for rating the counts as "light," threatening," "severe," or "very severe." It is recommended that such a system be worked out.

B. Eradication or control

None.

C. Regulatory

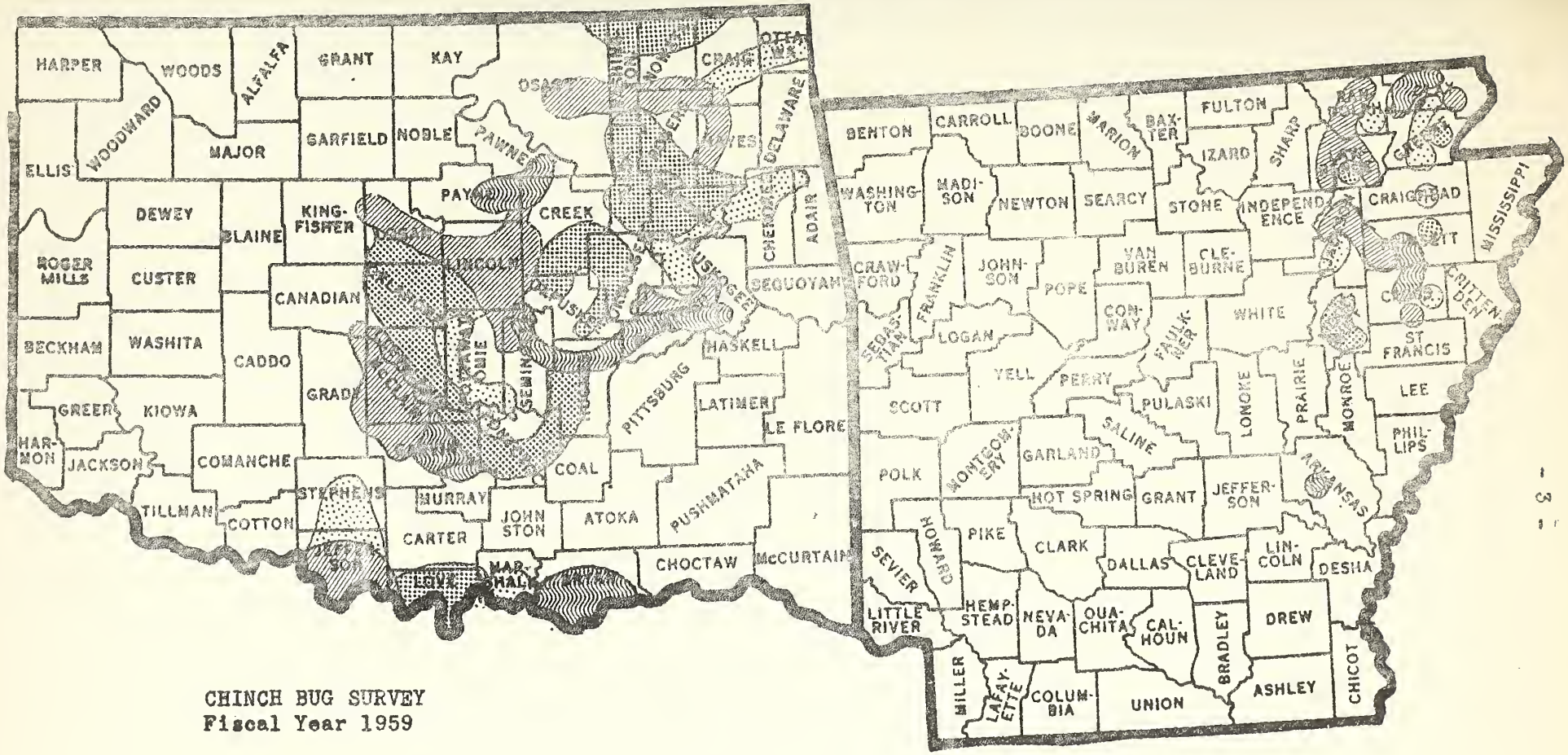
None.

D. Methods Improvement

None.

E. Associated activites

None.



CHINCH BUG SURVEY
Fiscal Year 1959

- Very Severe
- Severe
- Moderate
- Light

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
MEXICO REGION

ANNUAL PROGRAM REPORT

MEXICAN FRUIT FLY AND CITRUS BLACKFLY PROGRAM
Citrus Blackfly

July 1, 1958 - June 30, 1959

In cooperation with

MEXICAN DEFENSA AGRICOLA
and
MEXICAN NATIONAL BLACKFLY COMMITTEE

November 16, 1959
Monterrey, N. L., Mexico

W. K. Clore
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the Fiscal Year

At the start of the fiscal year, a relatively heavy infestation of citrus blackfly had been found at Allende, Nuevo Leon, approximately 130 miles south of the border. This extended over a considerable area and required the combined efforts of all spray equipment and men of the area to bring it under control. During the months of September and October, two infestations were found in Nuevo Laredo, Tamaulipas adjacent to the Texas border and, later on in the spring, one was found at Sabinas Hidalgo, Nuevo Leon and two in Monterrey, Nuevo Leon. These latter infestations were eradicated. A few light infestations were found in the vicinity of Montemorelos and Linares, Nuevo Leon and at Hidalgo, Tamaulipas. They also were eradicated.

In Hermosillo, Sonora, several light infestations were found during the year and were immediately eradicated. The year ended with no citrus blackfly in that area.

In the biological control zone of Tamaulipas and Sonora many thousands of parasites were introduced and released and at the end of the year the balckfly was well under control by these insects.

The quarantine inspection stations functioned as in the past with a considerable quantity of citrus blackfly host material being intercepted and destroyed.

B. Major Deviation from Work Plan

Although no basic changes in the program operation itself resulted, the Mexican National Blackfly Committee ceased to exist as such, in January, and the program work was taken over by the Defensa Agricola. The work has been somewhat curtailed due to the reduction in the number of their blackfly employees by the Defensa Agricola.

C. Status of Program at Close of Year

At the close of the fiscal year, the State of Sonora north of Hermosillo and northern Baja California remained free of the citrus blackfly. A few light infestations in the states of Tamaulipas and Nuevo Leon were still being sprayed. Eradication of the infestations which recur from time to time in Hermosillo, Sonora remains the objective there. The biological control work continued in progress from Guaymas, Sonora south in the West Coast states with control being generally good. In southern Tamaulipas it was necessary to control by the use of insecticides, several infestations which had built up in spite of the parasites.

In some groves, partial defoliation was necessary to assist the parasite control. Both insecticidal and biological control had progressed satisfactorily at the end of the fiscal year.

II. Program Activities during Fiscal Year

A. Planning and Direction

1. How Planned and Directed

The program was planned and directed and instructions issued jointly by personnel of the Plant Pest Control Division and the Direccion de la Defensa Agricola, through the then functioning National Blackfly Committee. In planning the program, close working relations were maintained with state delegates and the technical assistants of the Blackfly Committee and the biological control chiefs of the Defensa Agricola.

B. Technical Assistance

1. Technical Assistance Provided to Farmers and Others by Program Personnel

Technical assistance was rendered by an Entomologist who was formerly stationed in Mexico City until his death in January 1959. From that date until the end of the fiscal year, this position has been vacant.

2. Technical Assistance Provided to Program by Cooperating Agencies

Recommendations made as result of findings of the Fruit Insect Section of the Research Division are followed in the citrus blackfly program.

C. Survey

1. Procedures or Techniques Used

All surveys are visual. This work is being done cooperatively with the Mexican Government by crews of scouts for the purpose of determining the presence or absence of the insect in both the eradication and biological control zones. In the insecticidal control zone, an area found infested is delimited and a malathion spray applied. In the biological control zone, observations are made in order to determine the fluctuations which may exist in parasite populations and if found to be deficient, additional parasites are released. In order to inspect the maximum number of trees with the limited number of inspectors available, it has been found necessary to make

fast inspections in some areas. When an infestation is found, the inspection work is slowed down and the area delimited.

Random samples of infested leaves gathered in the biological control zone are taken to the laboratory in order to determine the degree of parasitization.

2. Accomplishments

During the fiscal year 1959, 26,985 properties were inspected with a total of 1,413,172 trees of which number 215,422 were nursery trees. 269 properties with 1,551 trees were found infested. See table 1

3. Statement or Table of Pest Damage

No economic damage was reported.

D. Eradication or Control

1. Procedures or Techniques Used

Eradication of the citrus blackfly in the chemical control zone is the objective. Although this has been possible in a number of localities, reinfestation occurs when contraband host material is introduced into the area. When survey reveals an infestation, the Mexican Government sprays the infested zone with 1.8 liters of 50% malathion in 1,000 liters of water, as well as a protective zone around the infested area. In the biological control zone, parasites are released whenever the population of citrus blackfly increases. In the biological control zone of Tamaulipas, a total of 3,821,650 parasites were liberated. Of this number 438,400 were Amitus hesperidum, 1,054,700 Prospaltella clypealis and 2,328,550 Prospaltella opulenta.

2. Accomplishments

During the year, 153,741 trees on 1,682 properties were sprayed with malathion.

E. Regulatory

1. Procedures or Techniques Used

Quarantine inspection stations are cooperatively maintained at strategic points in Western Mexico. Northbound passengers and cargo are inspected at railroad terminals, road stations and airports. At Ensenada, Baja California, a sea port, passenger and cargo traffic is also inspected. Host material is confiscated and destroyed.

ear inspections in west Prose. Also an interesting
wind, the inspection work is almost done and the
defined.

mation samples of diseased leaves gathered in the
ming the months of dessert division. Cell -
ults are tabled in the following section.

. Appendicitis.

Among the cases for 1939, 36,084 prosecutions were
with a total of 1,413,113 rose of which under 215,62
nursery crops. 265 properties with 1,351 new cert
ified. See table :

2. Strengths of Body Mass

My concern that we will continue.

. Introduction of ...

3. Increase ... pure ...

Practical ... of ... Council ... Council on ...
type is the ... (1), ... which ... can ... possible ...
nuclear ... (1) ... ...
west main ... ...
respond ... ...
interest ... ...
Bureau ... ...
... ...
... ...
... ...

. Procedures or ...ships ...:

. Use ...ency.

Staffed ... ...
during ... year, 153,743 times ... ... were
prepared with ... ...

2. Accountability ...

Certificates and 2,152,354 Insecurities were ...
number 139,460 were ...ployment ... 14,704 Proportion
a total of 3,921,350 persons were ...ployed. Of ...
increase, in the ...ological or zero zone ... ...
... reduced ... population of ... ...
highest ... ...
Bureau of ... ...
... ...
... ...
... ...

In Eastern Mexico, the Mexican Government maintains six inspection stations on highways leading to the Texas border. In the citrus area of Tamaulipas and Nuevo Leon, inspectors, paid by the Citrus Packers Association and supervised by Plant Pest Control employees, inspect sheds and trucks carrying citrus to the Texas border. The inspectors issue certificates which certify the trucks to be clean of all contraband plant material. This enables the truck to pass the border without off-loading on the Mexican side.

2. Accomplishments

In the citrus area, trucks carrying 352,388 standard boxes of citrus fruit for export to Canada and Europe through the United States were inspected and certified for movement through Texas ports of entry.

See Table 2 for confiscated contraband material at quarantine stations.

F. Methods Improvement (Not applicable)

G. Other

1. Cooperation Received During Fiscal Year

The National Blackfly Committe, and later the Defensa Agricola which took over the activities of the Blackfly Committee, continued to work closely with the program furnishing a major portion of the labor for survey, all of the insecticides and equipment used in applying the insecticides and the labor for applying insecticides as well as assisting in the maintenance of the road stations. All authority for the enforcement of the interior quarantines is vested in the Mexican Government.

2. Associated Activities and Services (Not applicable)

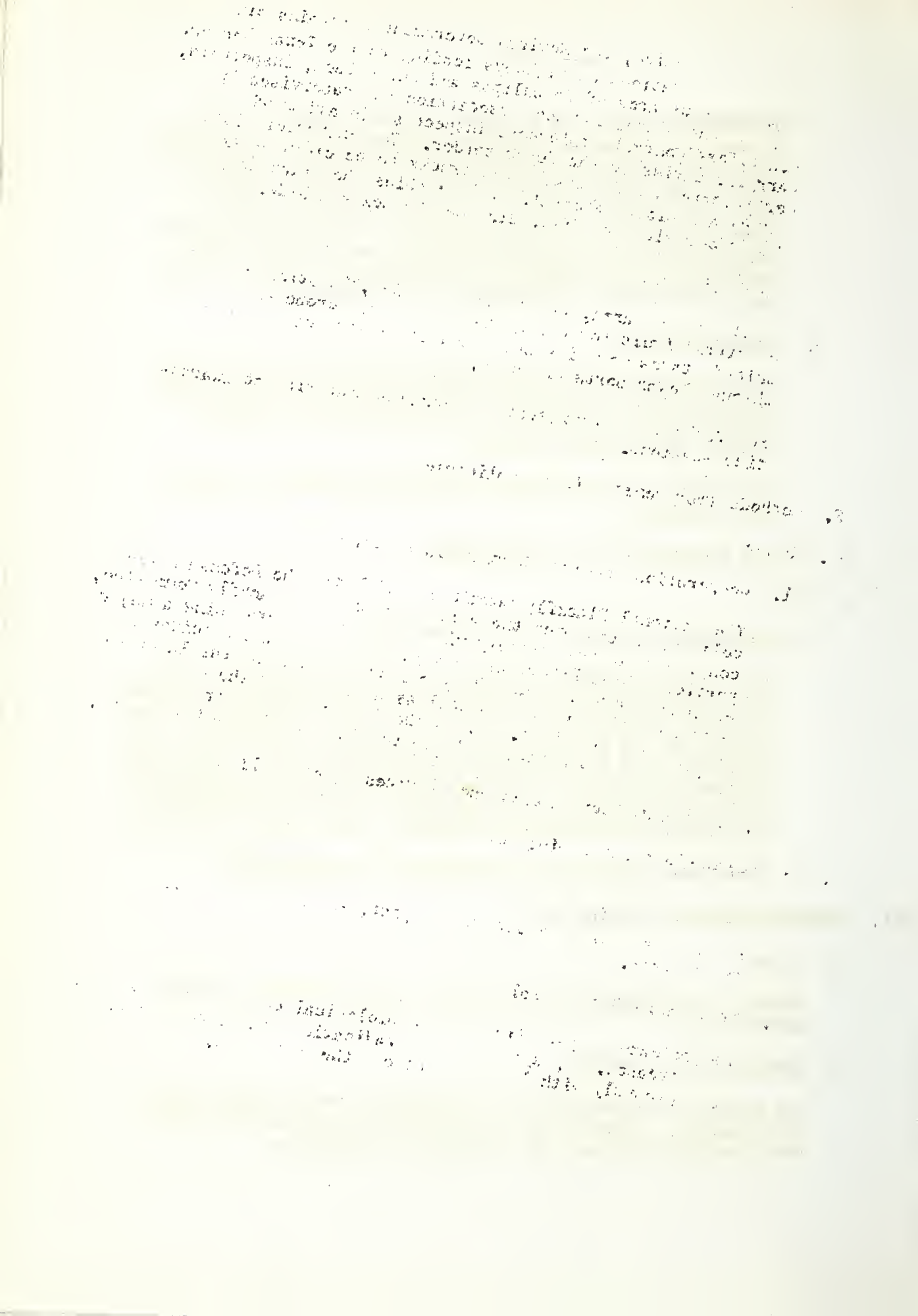
III. Recommendations for Coming Year

A. Survey

Surveys, as followed out in the past, should continue for the coming year.

B. Eradication or Control

The release of parasites in the biological control zones should be increased. Spraying in the eradication zone should be done more promptly with less lag between the sprayings.



C. Regulatory

Regulatory work at road stations, airports, sea ports and railroad stations should be continued in the future the same as in the past.

D. Methods Improvement (Not applicable)

E. Associated Activities (Not applicable)

CITRUS BLACKFLY

MEXICO

Period *(Designate: Month, 1-15, 16-31, or 1-31)*: July 1, 1958 to June 30, 1959

Date Prepared:

STATE COUNTY LOCATION A	INSPECTIONS BY LOCATION		INFESTATIONS BY LOCATION		CONTROL APPLICATIONS							
					Property Sprayed				Trees Sprayed			
	Properties Number B	Trees Number C	Properties Number D	Trees Number E	1st F	2nd G	3rd H	4th I	1st J	2nd K	3rd L	4th M
TAMAULIPAS	7,855	124,766	44	123	245	232	213	67	69,013	7,354	10,294	5,962
NUEVO LEON	15,450	849,437	224	1,420	1,436	1,424	913	735	83,059	89,831	85,836	56,145
SONORA	3,308	436,624	1	8	1				1,669			
BAJA CALIFORNIA	372	2,345										
Total This Period												
Total From July 1	26,985	1,413,172	269	1,551	1,682	1,656	1,126	802	153,741	97,185	96,130	62,107

PPC 7-3
(Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

COUNTY ASSESSMENT ROLL

STATE OF CALIFORNIA — COUNTY OF

| LOCATION (Parcel No.) | Property Owned | | |

Table 2

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

Mexico Region — Cooperative Inspection Stations — F.Y. 1959

Inspection Stations	Type of Inspection	Number of Inspections	Number of Passengers & Braceros	Pieces of Baggage & Express	RR Cars and trucks cleaned &/or fumigated	Host Interceptions					
						Occasions			Items		
						MFF	CBF	PBW	MFF	CBF	PBW
BAJA CALIFORNIA											
Tijuana	Plane	2,395	49,313	178,655		857	138				
Mexicali	Plane	1,039	13,269	47,207							
	Trucks	504				180	13	23	410	42	29
	Railroad	10,246		12,674	204						
Ensenada	Plane	484	2,238	9,880		39	5				
	Boat	135	910	1,843		21	6		1	2	
SONORA											
San Luis	Rd. Station	15,137				1,229	69	148	624	4	
Benjamin Hill	RR cars	7,710			2,107						
	RR passgr	-	219,982						24,550	1,392	5,590
	Rd. Station	155,897			290	30,713	2,978	1,501			
Nogales	Plane	936	17,494	36,859		483	40	85			
	RR Mkt. Mail	Daily				807	59				
SINALOA											
Mazatlan	Rd. Station	55,771	120,938		1,436						
	Plane	548									
	RR cars	408	19,658								2,053
	RR trains	610									and
	Baot	273									403 k. cottonseed
Terreros	Rd. Station	72,078	158,047		989						2,032
TOTALS		324,171	601,899	287,118	5,026	34,329	3,308	1,757	25,585	1,440	10,107

TABLE 3 — PROGRAM COST DISTRIBUTION

AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

NAME OF PROGRAM

TABLE 3 — PROGRAM COST DISTRIBUTION

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

NAME OF PROGRAM: CITRUS BLACKFLY | OPERATING UNIT: MEXICO REGION | SIGNATURE of Supervisor: W. R. Clarke | DATE: Nov. 16, 1959 | FISCAL YEAR: 1959

SOURCE OF CASH AND EQUIVALENT (A) *	PLANNING AND DIRECTION (B)	TECHNICAL ASSISTANCE (C)	SURVEY (D)	CONTROL (E)	REGULATORY (F)	METHODS IMPROVEMENT (G)	OTHER (H) Not Sub-divided	TOTAL (I)
1. PLANT PEST CONTROL ARS								
Headquarters	8,633	4,900		1,800				15,333
East Mexico	25,401		51,799					77,200
West Mexico	11,065		7,900		9,397			28,362
2. SUB-TOTAL	45,099	4,900	59,699	1,800	9,397			120,895
3. OTHER								
Citrus Packers Ass'n.					1,355			1,355
* Defensa Agricola							267,751	267,751
Patronatos							1,610	1,610
Industry							350	350
4. SUB-TOTAL					1,355		269,711	271,066
5. T O T A L	45,099	4,900	59,699	1,800	10,752		269,711	391,961
6. CONTRIBUTED SERVICES								
None								
7. T O T A L	—	—	—	—	—	—	—	—
8. GRAND TOTAL	45,099	4,900	59,699	1,800	10,752		269,711	391,961

* National Blackfly Committee functioned until January 1959.

• Column A: List entries in the following order:

1. PLANT PEST CONTROL DIVISION units. Name states. Include only direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

2. Sub-total for all PPC funds included in (1).

3. OTHER ORGANIZATIONS. Name organizations by States. Include only direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure, or measurable cash expenditure.

4. Sub-total for all OTHER ORGANIZATIONS, funds included in (3).

5. Totals of PPC and OTHER ORGANIZATIONS, funds included in (2) plus (4).

6. CONTRIBUTED SERVICES. Name organizations by State. Limit to services incidental to other activities for which only an estimated value is available.

7. Total of CONTRIBUTED SERVICES, items included in (6) only.

8. GRAND TOTAL of (5) and (7) entries.

PPC Form 1-10
Mar 1958

SOURCE OF CASH AND EQUIVALENT	ORIGINAL BUDGET (B)	CHANGES IN BUDGET (C)	VARIANCE (D)	CONTROL (E)	BUDGET VARIANCE (F)	IMPROVEMENT THEM (G)	TOT. (H)
(A)							

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

CITRUS BLACKFLY

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for the fiscal year

Extensive surveys were made by State and Federal crews in the major citrus producing counties of South Texas (Cameron, Dimmitt, Hidalgo, and Webb) during an eight-month period of fiscal year 1959 (approximately July, 1958 - September, 1958, inclusive, and February, 1959 - June, 1959, inclusive). No citrus blackfly infestations were found. Three consecutive inspection periods have been negative since the last infestation of 1956 was found.

B. Major deviation from Work Plan

None

C. Status of Program at close of year

As of June 30, 1959, the citrus blackfly apparently had been eradicated in Texas where 33 infestations were found in 1955 and 1956. The last infestation discovered was on August 31, 1956.

Surveys were in progress at the close of the year and will continue through most of the 1st quarter of fiscal year 1960.

II. Program Activity During Fiscal Year

A. Planning and Direction

The survey program was planned and directed by supervisory personnel of the Plant Pest Control Division and the Texas State Department of Agriculture. In the survey operations, both agencies maintained close working relations throughout the year. Personnel of the State Department of Agriculture also stood by, ready and equipped to handle control operations in case infestations had been discovered.

B. Technical Assistance

1. Technical assistance provided to orchardists by Program personnel was largely of an educational nature. In the survey work performed, many contacts were made with citrus growers who were anxious to learn more about the citrus blackfly. At every opportunity, Program personnel, both State and Federal, furnished owners and caretakers information on the insect, such as appearance, life history, damage and cost of control.

2. Staff personnel of Texas Department of Agriculture, especially those stationed in local area, cooperated throughout the year with surveys made along with their regular nursery inspections and certification work.

C. Survey

1. Procedures or techniques used

a. Visual inspection of foliage and trees, the only known method of survey, was used. This method is very tedious and time-consuming. Early surveys were made leaf-by-leaf; however, the so-called "speed-up" method, devoting only 5 to 7 minutes per tree, has been in use for several years. Citrus blackfly forms are always attached to the underside of the leaves, and by crouching or standing inside and under the tree, trained inspectors can detect infestation several feet away.

b. No laboratory procedures were used. Tentative identifications of material collected were made in the laboratory; however, all suspicious specimens submitted were forwarded to Division headquarters for official determination.

2. Accomplishments

During fiscal year 1959, surveys were conducted during the months of July, August, September, and February through June. Inspections were made of 230,139 trees on 14,609 properties located in Cameron, Hidalgo, Webb, and Willacy counties. No signs of citrus blackfly were detected.

3. Statement or table of pest damage

Not applicable since no infestations were found.

D. Eradication or Control

1. Procedures or techniques used.

When infestations are found, eradication measures are applied immediately. Infestations found in previous years were eradicated with three applications of an oil-rotenone spray at 21-day intervals.

2. In the absence of infestations, no control was necessary this year.

E. Regulatory

There was no regulatory work connected with the Program in Texas.

F. Methods Improvement

1. Work Performed

No specific work was done on methods improvement

2. Accomplishments

Not applicable.

G. Other

1. Cooperation received during fiscal year

a. The Texas Department of Agriculture assisted in surveys throughout the inspection period.

Citrus growers cooperated to the fullest extent during the survey, and were anxious to have their properties inspected for citrus blackfly.

Newspapers, TV and radio stations gave publicity to the survey program. This assistance was most helpful in informing the public that surveys were being made again this year.

Several groups of Program inspectors were taken into northeast Mexico for a short training period before starting surveys in Texas. Personnel of the Mexican Department of Agriculture and Division personnel of the Mexico Region gave valuable assistance by conducting the in-training classes.

b. Continued cooperation from all sources can be expected in the future, as citrus growers and others interested in the industry are much in favor of preventing the citrus blackfly from becoming established in Texas.

2. Associated activities and services

Other than newspaper articles and radio and TV announcements, there were no associated activities on the program this fiscal year.

III. Recommendations for Coming Year

A. Survey

Surveys should be continued as extensively as funds will permit in order to prevent this citrus pest from becoming established in this country.

B. Eradication or control

Not applicable unless infestations are discovered.

C. Regulatory

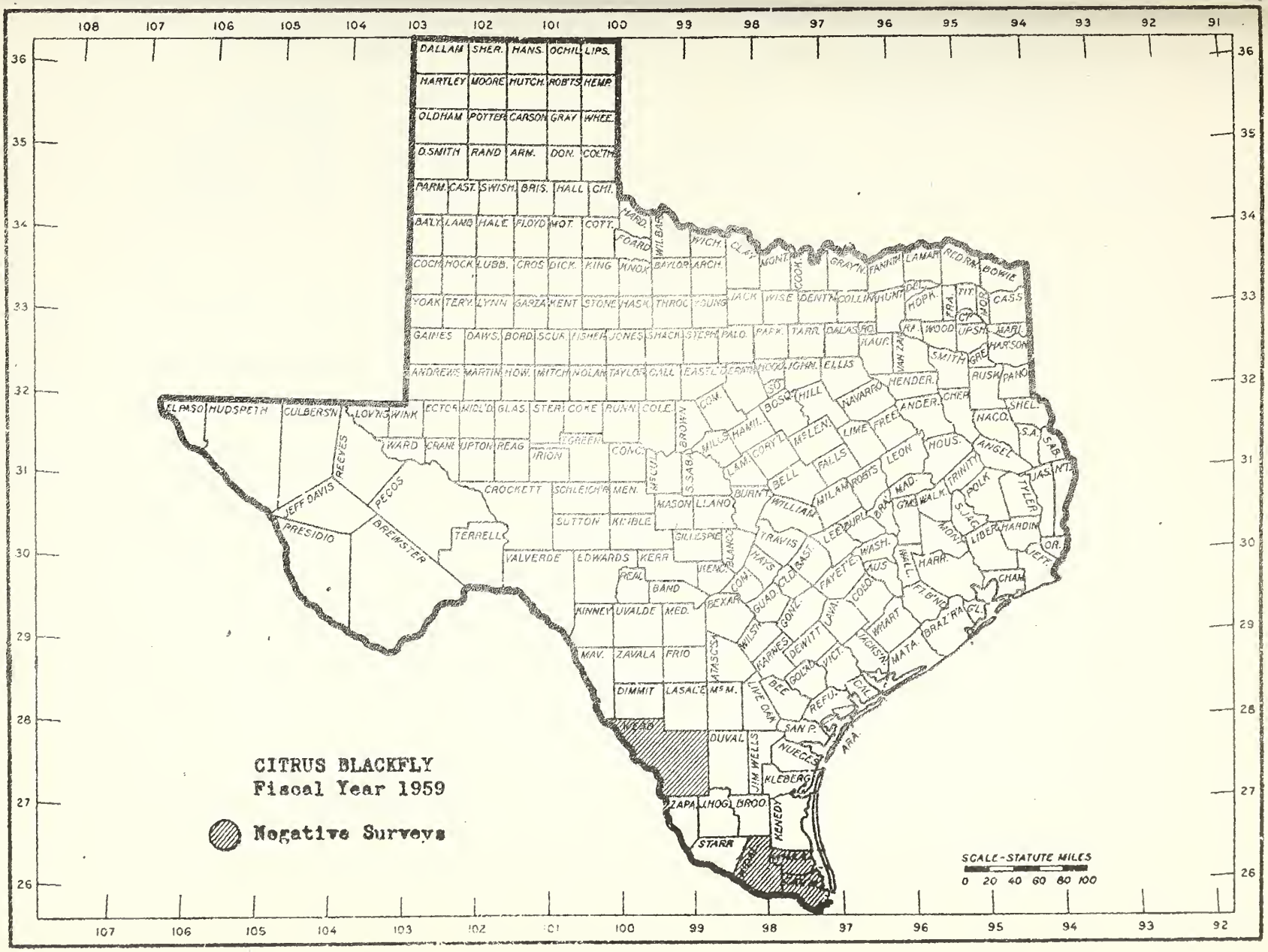
No regulatory measures needed unless infestations are found.

D. Methods Improvement

A better survey method is badly needed. Work should be done towards the development of a trap and lure for use in surveys. The possibility of a light trap should be fully explored.

E. Associated Activities

These activities should be continued in order that the citrus industry and the public can be on constant lookout for this insect.


CITRUS BLACKFLY
Fiscal Year 1959
Negative Surveys
SCALE - STATUTE MILES
0 20 40 60 80 100

CITRUS BLACKFLY

Region	Prepared by
Southern	
Period *(Designate: Month, 1-15, 16-31, or 1-31)*	Date Prepared
Fiscal Year 1959	

STATE COUNTY LOCATION A	INSPECTIONS BY LOCATION		INFESTATIONS BY LOCATION		CONTROL APPLICATIONS							
					Property Sprayed				Trees Sprayed			
	Properties Number B	Trees Number C	Properties Number D	Trees Number E	1st F	2nd G	3rd H	4th I	1st J	2nd K	3rd L	4th M
TEXAS:												
Cameron	6,011	63,267	0	0								
Hidalgo	2,417	121,847	0	0								
Webb	6,128	40,066	0	0								
Willacy	53	4,959	0	0								
Total This Period												
Total From July 1, 1958	14,609	230,139	0	0	-	-	-	-	-	-	-	-

PPC 7-3
(Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Citrus Blackfly

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: D. M. McEachern

Region Southern - Texas

Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
Texas	0	0	1	2	0	0	0	0	0	0	0	0
Total												

(*--*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

COOPERATIVE ECONOMIC INSECT SURVEY

July 1, 1958 - June 30, 1959

COOPERATING AGENCIES:

State Plant Pest Control Agencies
Extension Service, Experiment Stations
and
Plant Pest Control Division
Agricultural Research Service
U. S. Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During the year, 298 weekly reports on economic insect conditions were submitted. This was an increase over the previous year in spite of the fact that only 12 of the 13 states participated. Summaries were received from nearly all of the participating states. More information was received on losses due to insect activity than previously. Nine of the 13 states made surveys to determine the fall abundance of the European corn borer. Other surveys were conducted on an informal basis such as boll weevil, khapra beetle, and soybean cyst nematode.

B. Major deviation from Work Plan, if any

None.

C. Status of Program at close of year

Five states continued to conduct surveys under cooperative agreements. We have had an increase in the participation of Division personnel in this work, especially in the five states where survey entomologists were employed. Gradual progress in this direction was made in all of the states in spite of heavy workloads being carried by each Division employee.

II. Program Activity during Fiscal Year

A. Planning and Direction

1. In States where cooperative agreements are in effect, a formal work plan was prepared on a seasonal basis at the beginning of the program. These plans continue from year to year and are reviewed in conferences with the survey entomologists, State clearing house officers and Division personnel. Undertakings are primarily directed by State clearing house officers whether or not an agreement is in effect. Formal meetings of the Survey Advisory Committee, or a similar group, were held at which time the work plan, agreement and season's work were reviewed. Many informal conferences were also held.

B. Technical Assistance

1. The Division provides, where necessary, identification of insects and maintains a file on occurrence and distribution of various pests. Reports are received weekly from clearing houses and consolidated into a weekly issue on Cooperative Economic Insect conditions which is available to all interested persons.

2. Most of the survey work and compilation of information is performed by cooperating agencies at the State level. This provides current information on local insect conditions and also is a basis for control and other helpful recommendations to growers.

C. Survey

1. The procedures used in both field and laboratory are standard as recognized by the Entomological Society of America. They are for the most part outlined in "Survey Methods" prepared by various survey entomologists throughout the nation and published by the Division in 1958. As new techniques are developed, they are reported and this information is made available to all concerned.

2. There are no data available showing the number of acres surveyed, by pests or crops, since such detailed records are not maintained. There are five survey entomologists working full time during the season and in addition there are an estimated 25 to 35 State and Federal men engaged in extension, control, and research who devote a substantial portion of their time to making systematic observations. In addition, there are perhaps 3 or 4 times this number of individuals who make casual observations and report findings to State clearing houses. While the accomplishments in the aggregate are considerable, there remains much room for expanding and coordinating this work.

3. Specific information on losses caused by insects is fragmentary due to the difficulty of developing such data. An estimate for the 1958 season, covering four crops and fourteen insects in Maryland, was made. The crops were alfalfa, clover-timothy hay, tobacco, and field corn. The total value of the yield was 70 million dollars with 5 million lost to insects and an additional 5½ million dollar loss prevented by the timely application of controls costing 600,000 dollars. If this loss on four crops in one state was projected to cover all crops in the thirteen states of the region the total "take" by the insects would be appalling.

D. Eradication or Control

None

E. Regulatory

None

F. Methods Improvement

None

G. Other

1. Cooperation received during fiscal year

a. Systematic surveys by state employees.

Casual observations by State and Federal employees.

Observations associated with specific assignments, such as by extension men.

Assembling and compiling the above information into a report.

Soliciting cooperation from all persons in a position to help.

Developing interest necessary to maintain this cooperation.

b. The principal need in this program is expanded detection survey and related problems.

Other phases in need of strengthening are increased participation on the part of persons in a position to help and increased interest.

Plans are developing for making a beginning along some of these lines during the 1960 season.

2. Associated activities and services

Fall abundance surveys for the European corn borer were conducted in nine states. There was an increase in the amount of interest in determining the population of corn borer parasites. This pest seems to be increasing on a wide range of host plants in the six southern states in the Region.

III. Recommendations for the Coming Year

A. Survey

Attempt to develop annual or semi-annual conferences enabling survey entomologists and clearing house officials to meet and discuss mutual problems, assisting each other in developing solutions.

Discuss ways and means of estimating losses caused by insects and attempt to standardize the formula for given situations.

Develop some means of processing at least some of the insect material obtained in the European chafer black light traps.

IV. Appendix

A. Maps

None

TABLE #1

STATE	CLEARING HOUSE	SURVEY ENTOMOLOGIST
Connecticut	Mr. J.Peter Johnson Assistant Entomologist Conn. Agricultural Experiment Station, New Haven, 4, Conn.	
Delaware	Dr. Dale F. Bray, Head Department of Entomology University of Delaware Newark, Del.	Dr. Paul Burbutis Asst. Prof. Entomology University of Delaware Newark, Delaware.
Maine	Dr. G.W. Simpson, Head Department of Entomology University of Maine Orono, Maine	
Maryland	Mr. T. L. Bissell Extension Entomologist University of Maryland College Park, Md.	Mr.Wallace C. Harding, Jr. Extension Instr. Entomology University of Maryland College Park, Md.
Massachusetts	Dr. E. H. Wheeler Prof. of Entomology University of Mass. Amherst, Mass.	
New Hampshire	Dr. J. G. Conklin Prof. of Economic Entom. University of N. H. Durham, N. H.	
New Jersey	Dr. B. B. Pepper Prof. of Entomology Rutgers University New Brunswick, N. J.	
New York	Dr. A. A. Muka Entomology Department Cornell University Ithaca, New York	
Pennsylvania	Mr. J. O. Pepper Prof. Ext. Entomology Pa. State University State College, Pa.	

TABLE #1 (Continued)

STATE	CLEARING HOUSE	SURVEY ENTOMOLOGIST
Rhode Island	Dr. F. L. Howard, Head Dept. Plant Pathology & Entomology University of R.I. Kingston, R. I.	Dr. Harry L. Hansen Res. Prof., Plant Pathology & Entomology University of R. I. Kingston, R. I.
Vermont	Mr. John Scott, Director Div. Plant Pest Control State Dept. of Agriculture Montpelier, Vt.	
Virginia	Dr. J. O. Rowell Extension Entomologist Virginia Polytechnic Inst. Blacksburg, Va.	Mr. Arthur P. Morris Assoc. Ext. Entomologist Virginia Polytechnic Inst. Blacksburg, Va.
West Virginia	Dr. C. K. Dorsey Prof. of Entomology West Virginia University Morgantown, W. Va.	Mr. W. H. Gillespie Survey Entomologist State Department of Agriculture Charleston, 5, W.Va.

COOPERATIVE ECONOMIC INSECT SURVEY

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

Cooperative Economic Insect Survey

July 1, 1958 - June 30, 1959

In cooperation with
County, State, Federal, and Local Agencies

December 1, 1959
Oakland, California

Jim R. Dutton
Regional Supervisor

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HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

The Arizona survey program was reactivated on March 1, 1959. Mr. Leon Moore was employed as Survey Entomologist and headquartered at Phoenix in the State Entomologist's office. All three State agencies cooperated financially in the program, with the Extension Service as prime sponsor. The Entomology Specialist has assumed responsibility as Clearinghouse Head.

During the year, work plans were reviewed and rewritten for the States of Wyoming, New Mexico, California, Colorado, Oregon, and Arizona.

Cooperating with Entomology Research Division, beet leafhopper surveys were made in the spring breeding areas of Arizona, California, Nevada, and Utah. Plant Pest Control personnel performed the same surveys independently of Entomology Research in the States of New Mexico and Colorado. Potato psyllid surveys were made by Plant Pest Control personnel in the spring breeding areas of New Mexico, Arizona, and California, followed by a series of five surveys at 2-week intervals beginning in March in the summer breeding areas of Utah, Colorado, and Wyoming.

Beet leafhopper control conducted in cooperation with Entomology Research was accomplished on 2,891 acres, principally on right-of-ways, in parts of four counties in southwestern Idaho in June. A greatly accelerated Japanese beetle trapping program was instituted this year in cooperation with the States of California, Arizona, Washington, Oregon, Colorado, Idaho, New Mexico, and Montana. A total of 1,276 traps was exposed at all commercial and military airports in the states named. Airports selected were usually those where stops were made by flights originating in heavily infested Japanese beetle areas of the eastern United States.

Major Deviation from Work Plan

Oregon's Cooperative Survey Entomologist was granted a one-year leave of absence by the State cooperators, beginning December 1, 1958. Since they were unable to fill the position on an interim basis, the program was not active during the succeeding seven months. The clearinghouse continued to function, with some reports being submitted for inclusion in the national release of the Cooperative Economic Insect Report.

We were advised early in the calendar year that full responsibility for the beet leafhopper surveys in the spring breeding

areas of Arizona, California, Utah, and Nevada would be transferred from Entomology Research to Plant Pest Control Division beginning January 1960. Increase in Japanese beetle trapping, which, up to now, had been done entirely by cooperating states, required some adjustment of work schedules by Plant Pest Control personnel placing and servicing the traps.

Status of Program at Close of Year

Idaho's cooperative agreement was discontinued at the request of the University of Idaho effective June 30, 1959.

As Oregon could not locate a Survey Entomologist, their agreement remained inactive at the close of the fiscal year.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

The Survey Entomologist remains administratively responsible to the prime cooperator in his respective state. The prime contractor, in the case of the survey program, can be any one of the three state agencies. The Survey Entomologist works closely with the State Survey Advisory Committee, comprised of a representative from each of the state agencies and the Plant Pest Control Division Supervisor in Charge.

Survey activities within a state are based on the terms of the agreement and supported by a work plan, developed and mutually agreed upon by the cooperators and the Division.

Planning and directing the beet leafhopper survey program in the spring breeding areas of California, Arizona, Utah, and Nevada was done by Entomology Research Division. Planning of the other service surveys - potato psyllid and beet leafhopper in New Mexico, Arizona, Colorado, and California - was done by the Western Regional office of Plant Pest Control Division.

Technical Assistance

An integral part of the reporting service is the proper identification of insects and screening of information received to assure its accuracy. In most cases, this becomes the responsibility of the entomology department of each state college. Technical assistance in providing timely notes on

occurrence, abundance, and location of economic insect pests was provided by qualified individuals at Experiment Stations and Extension Services, by State and Federal personnel, and by private and commercial entomologists.

Technical advice in connection with the beet leafhopper control program in Idaho was rendered by Entomology Research Division, Twin Falls station. Beet leafhopper surveys in the spring breeding areas were under the technical direction of Entomology Research, Logan station, Utah.

Survey

Procedures or techniques used

Field

Recommended survey techniques and procedures were followed insofar as was possible.

Laboratory

Not applicable.

Accomplishments

Beet Leafhopper - Plant Pest Control personnel participated in the beet leafhopper survey in Idaho, assisting Entomology Research personnel who were responsible for delimiting the control area, timing control application, and evaluating results. Early spring surveys were conducted cooperatively with Entomology Research in the States of Arizona, California, Nevada, and Utah. This particular survey was made at monthly intervals beginning in February.

A similar survey was made by Plant Pest Control Division in Colorado and New Mexico. This effort is a one-time check usually made in March and timed to coincide with a similar effort made in Texas by Plant Pest Control personnel of the Southern Region.

Potato Psyllid - Surveys were made during the month of March in the spring breeding areas of New Mexico, Arizona, and California. A series of five surveys followed on a biweekly schedule beginning in May in the summer breeding areas of Utah, Wyoming, and Colorado. All collections were made on several species of wild Lycium in the spring breeding areas and on cultivated Lycium (Lycium halimifolium) in the summer breeding areas.

Halogeton - Except for an occasional field trip made with and sponsored by Bureau of Land Management, there was no activity on the program other than continued observations for the plant during the course of regular program activity.

Japanese Beetle - A total of 1,276 Japanese beetle traps was exposed at military and commercial airports in cooperation with state agencies. Traps and lure were supplied by Plant Pest Control Division. No Japanese beetles were recovered.

Eradication or Control

Procedures or techniques used

Halogeton - Colorado: One Buffalo turbine was lent to Colorado cooperators for use in the Grand Junction area on a halogeton suppression program.

Beet Leafhopper - Idaho: Control of beet leafhoppers by chemical means is accomplished by the use of spray composed of one pound of DDT in two gallons of diesel oil applied to host-plant areas at the rate of two gallons per acre by either aircraft or ground equipment.

Regulatory

Not applicable.

Methods Improvement

Work performed

Federal (Bureau of Land Management) activity, instigated during 1958 fiscal year, of reseeding beet leafhopper host-plant acreage with crested wheat progressed as planned. First-year growth was hard to evaluate, but it is presumed to be successful.

RECOMMENDATIONS FOR THE COMING YEAR

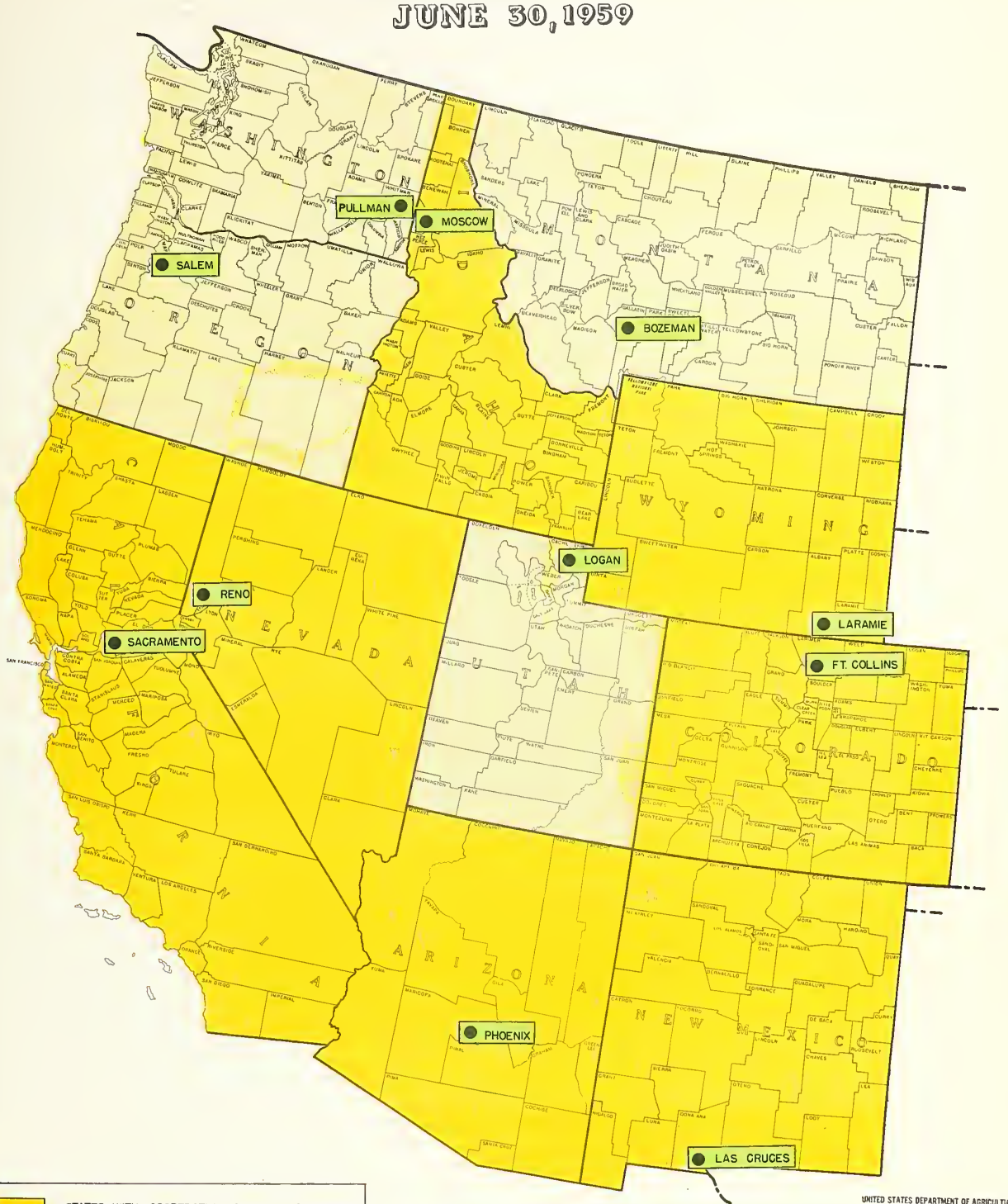
Survey

It is recommended that much closer liaison and actual participation be maintained between Plant Pest Control and all State personnel.

We also recommend that a complete study be made of service surveys, such as beet leafhopper and potato psyllid, to determine the necessity of the surveys and their importance to industry and growers.

COOPERATIVE ECONOMIC INSECT SURVEY

JUNE 30, 1959



UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 1959

GPO 979051

Survey Entomologists

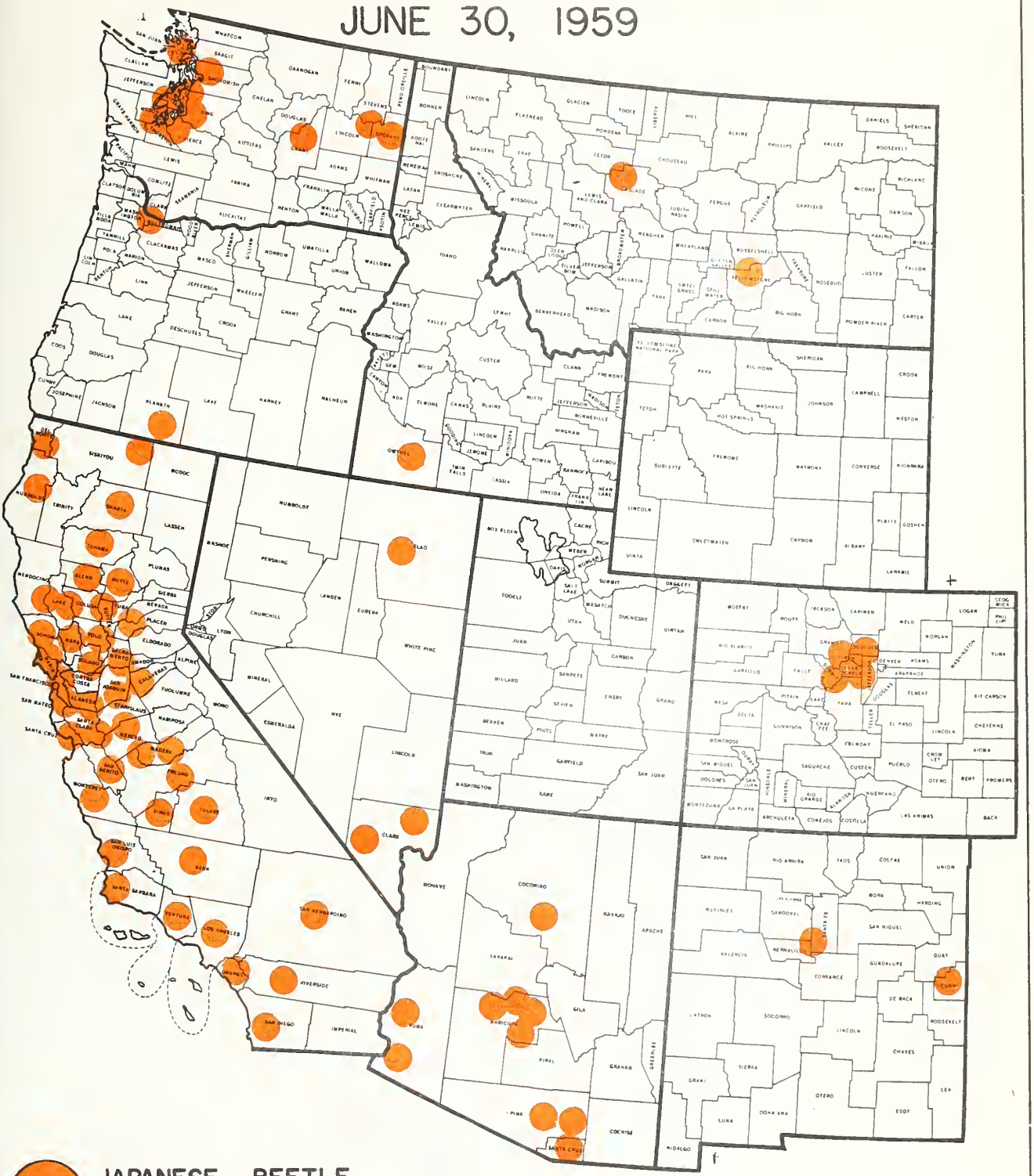
Arizona	Mr. Leon Moore Arizona Commission of Agriculture and Horticulture	Phoenix
California	Mr. Ronald Hawthorne State Department of Agriculture	Sacramento
Colorado	Mr. Leonard E. Jenkins Colorado State University	Ft. Collins
Idaho	Dr. Benjamin A. Foote University of Idaho	Moscow
Nevada	Mr. Robert C. Bechtel State Department of Agriculture	Reno
New Mexico	Dr. Gerald L. Nielsen State Department of Agriculture	Las Cruces
Wyoming	Mr. Arlen D. Davison University of Wyoming	Laramie

State Clearing Offices
For Economic Insect Survey Reports

Arizona	Dr. James N. Rooney, Extension Entomologist University of Arizona, Phoenix
California	Mr. Robert W. Harper, Chief, Bureau of Entomology State Department of Agriculture, Sacramento
Colorado	Dr. Leslie B. Daniels, Head, Department of Entomology, Colorado State University, Ft. Collins
Idaho	Dr. H. C. Manis, Head, Department of Entomology University of Idaho, Moscow
Montana	Dr. James H. Pepper, Head, Department of Zoology and Entomology, Montana State College, Bozeman
Nevada	Mr. Lee M. Burge, Director, Division of Plant Industry State Department of Agriculture, Reno
New Mexico	Mr. Dallas Rierson, Director, New Mexico Department of Agriculture, New Mexico State University, University Park
Oregon	Mr. Frank McKennon, Director, State Department of Agriculture, Salem
Utah	Dr. George F. Knowlton, Extension Entomologist Utah State University, Logan
Washington	Dr. Horace S. Telford, Chairman, Department of Entomology, Washington State University, Pullman
Wyoming	Mr. Ted R. Robb, Extension Entomologist University of Wyoming, Laramie

JAPANESE BEETLE PROGRAM

JUNE 30, 1959

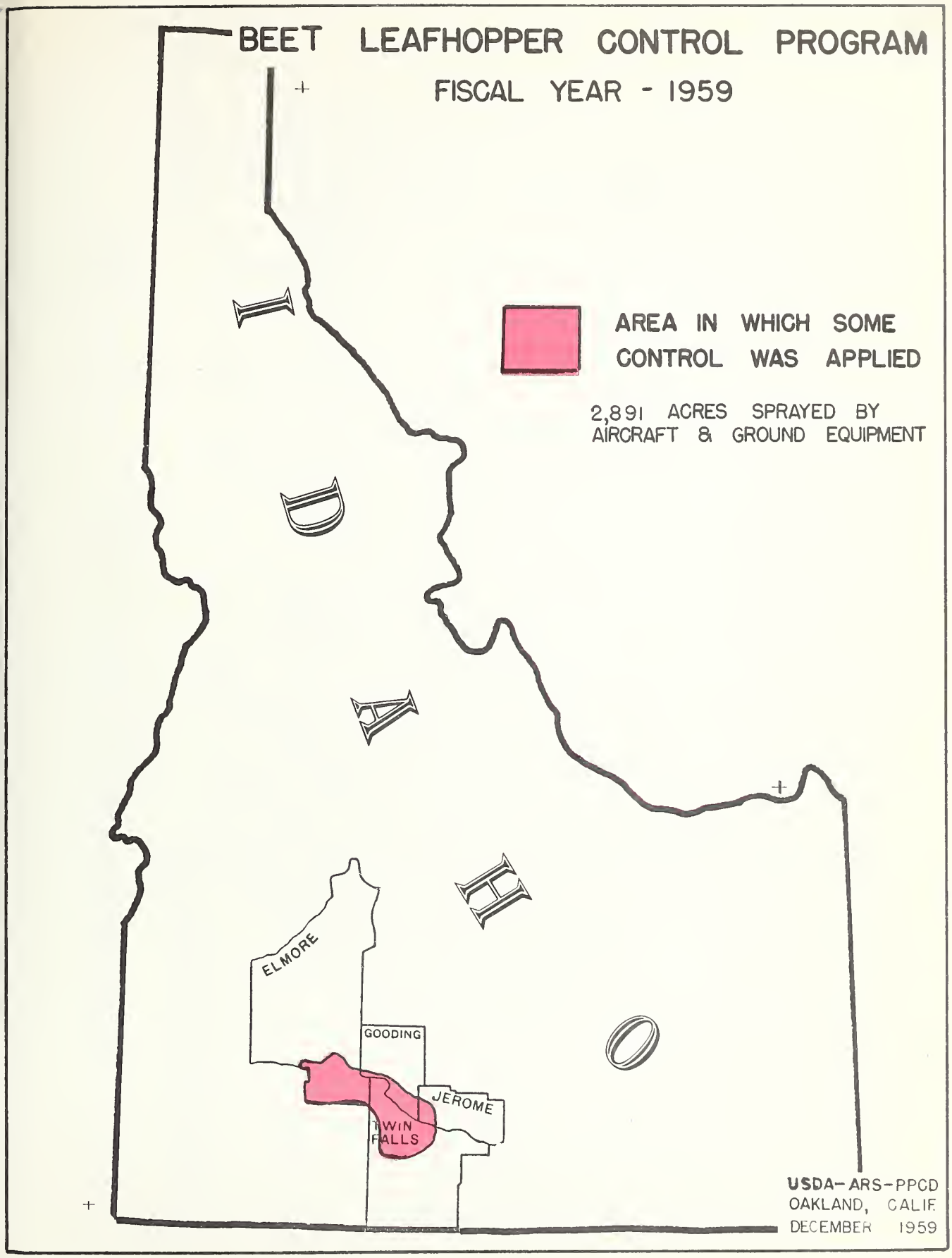


JAPANESE BEETLE
TRAP LOCATIONS

TOTAL TRAPS EXPOSED--- 1276

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OAKLAND, CALIFORNIA
OCTOBER 1959

GPO 979174


BEET LEAFHOPPER CONTROL PROGRAM
FISCAL YEAR - 1959
AREA IN WHICH SOME CONTROL WAS APPLIED
2,891 ACRES SPRAYED BY AIRCRAFT & GROUND EQUIPMENT
ELMORE
GOODING
JEROME
TWIN FALLS
USDA-ARS-PPCD
OAKLAND, CALIF.
DECEMBER 1959

GPO 979321

Summary of Federal Expenditures, State Contributions, and Agreement Status
Period Ending June 30, 1959

Cooperative Economic Insect Survey — Fiscal Year 1959

STATE	Active Agreement	Pending Agreement	Period of Contract in Months	PPCD Expenditure 1959	Estimated Contribution by Sponsoring Agency Toward Cooperative Survey	Estimated Value by State Agricultural Agencies Toward Survey and Detection	
Arizona	X		12	$ 1,750	No Report		
California	X		12	5,000	$ 5,510	$ 125,000	
Colorado	X		8	3,135	3,145	13,121	
Idaho	X		6	2,250	3,170	4.000	
Montana							
Nevada	X		8	3,500	4,007	3,484	
New Mexico	X		9	3,300	4,625	1,000	
Oregon				1,596	1,806	42,893	
Utah							
Washington							
Wyoming	X		9	3,600	2,707	0	

EXPENDITURES BY SOURCE AND ACTIVITY

Beet Leafhopper

Fiscal Year 1959

	1	2	3	4	5	6	7	8
Source of Cash & Equivalent*	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
Plant Pest Control Division	$ 850			$1,883				$2,733
Other Organizations (Name)								
State of Idaho				3,240				3,240
Ent. Research Division				2,500				2,500
Subtotal Other Organizations				5,740				5,740
Total (of PPC & Other)	$ 850			7,623				8,473
Contributed Services**								
Total								
Grand Total	$ 850			$7,623				$8,473

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

(*__*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

EUROPEAN CHAFER

July 1, 1958 - June 30, 1959

COOPERATING AGENCIES:

State Plant Pest Control Agencies
Experiment Stations, Extension Service
and
Plant Pest Control Division - Entomology Research Division
of the
Agricultural Research Service
U. S. Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of year's program activity

A. Accomplishments for the fiscal year

Surveys in New York showed some extension of previous infestations at Buffalo, Lockport, Niagara Falls, and Syracuse. An unconfirmed find was reported at Chittenango. For the second successive year, no chafers were found at previously infested sites in Elmira and Minetto, but a new infestation was found at Southport, a community adjacent to Elmira on the south. Results were negative in several eastern counties of the state where spot surveys were conducted. At Meriden, Connecticut, where improved plastic bait traps caught two chafers in June, 1958, no beetles were observed or caught in new black-light traps in 1959. Surveys at Capon Bridge, West Virginia, were negative at the end of the reporting period. (However, one black-light trap set at that location caught one chafer on July 2, 1959. This was the only finding in West Virginia during the calendar year 1959.) In the spring of 1959, larval specimens from a private property in Brooklyn, New York, were identified as European chafer. Subsequent grub surveys indicated this infestation involved about 14 square miles, which was placed under State quarantine by the New York Department of Agriculture and Markets. Visual and trapping surveys during the adult season, in progress at the close of the fiscal year, revealed a further extension of infestation in Brooklyn, and additional infestations were found at sites on Governor's Island, Liberty Island, Staten Island, and Battery Park, Manhattan.

The New York Department of Agriculture and Markets, in cooperation with communities concerned, and this Division, applied control treatments at all known isolated infestations in upstate New York, totalling 565.5 acres, and on 63 acres of parkway turf in Brooklyn. The Connecticut Experiment Station applied control treatments on 10 acres at the Meriden infested site in the fall of 1958.

During the year, nursery products and other regulated materials valued at more than 28 million dollars were certified for movement from regulated areas in compliance with quarantine regulations. Affected industries continued an aggressive certification soil treatment program.

B. Major deviation from work plan

Discovery of infestation at Brooklyn, New York, necessitated the expansion of survey and control efforts in the New York Metropolitan area and in adjoining sections of New Jersey.

C. Status of program at close of year

A significant change in status resulted from the discovery of the Brooklyn, New York infestation. In effect a new area of general infestation has been added to the other areas located in and around

Newark and Syracuse, New York. Although plant growing establishments engaged in other than localized business are not located in the new area, a possible hazard of spreading adult beetles is evident in the heavy volume of vehicular, rail, and boat traffic through this infested territory. The problem of conducting adequate surveys and subsequent control measures in all peripheral areas has become more acute since the detection of these new infestations.

There was some extension of previously known infestations at Buffalo, Lockport, Niagara Falls, and Syracuse, New York.

II. Program activity during fiscal year

A. Planning and direction

Program activities were planned and directed jointly by State and Division personnel in charge of cooperative plant pest control programs. The New York Experiment Station, Geneva, and the Entomology Research Division, ARS, participate in planning research and methods improvement activities.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel

Program personnel advised regulated industry in the application of approved treating methods for quarantine compliance. Also, supervision and technical advice was given to community representatives participating in local control treatments.

2. Technical assistance provided to program by cooperating agencies

The program received valuable technical assistance from the New York State Experiment Station and from the Entomology Research Division in connection with development and improvement of treatments for both control and regulatory activities; and in the further development of traps and lures for improvement of survey methods and techniques.

C. Survey

1. Procedures or techniques used

a. Field

Visual observations are made at dusk, when the adult beetles emerge from the ground and fly to nearby silhouetted objects where they swarm, mate, and rest. Observations are, therefore,

limited to the very short flight periods during the evenings when the weather is clear. Grub surveys are made in suspect locations. This method was employed extensively in Brooklyn during the spring of 1959 in efforts to delimit infestation. During June, 1959, a newly developed fluorescent black-light trap was placed in use to supplement observations.

b. Laboratory

Not applicable

2. Accomplishments

The normal adult chafer survey season (June, July, August) overlaps two annual fiscal year report periods. Survey information is reported accordingly.

Visual observations were made in peripheral limits of the three generally infested areas at Newark, Syracuse, and Brooklyn, New York; and at isolated areas of previous infestations at Buffalo, Lockport, Niagara Falls, Elmira, and Minetto, New York; at Meriden, Connecticut; and Capon Bridge, West Virginia. Observations were also made at numerous selected sites throughout the region where nursery stock from the infested area had been shipped prior to establishment of the quarantine.

At the beginning of the reporting period (July, 1958) visual observations at Syracuse, New York, and Meriden, Connecticut, were supplemented by use of improved plastic bait traps. During June, 1959, newly developed fluorescent black-light traps were employed, 20 to delimit the Brooklyn infestations, 41 around known or previously infested sites in upstate New York, 10 at Meriden, Connecticut, and 10 at Capon Bridge, West Virginia.

As a result of scouting in New York State, infestation was found at Southport (near Elmira) and beyond the limits of territory previously treated in Buffalo, Lockport, and Niagara Falls. Infestation was detected by use of black-light traps in June in the Metropolitan New York area at Battery Park, in lower Manhattan, on Liberty Island (formerly known as Bedloe's Island), Governor's Island and on Staten Island. (One of the black-light traps operated in the Capon Bridge, West Virginia area caught one adult chafer on July 2, 1959.)

The first emergence of adult chafers was observed at Brooklyn, New York on June 1. In upstate New York, the first adult was caught on June 7 in one of the experimental traps set near Clifton Springs.

3. Statement or table of pest damage

Turf damage occurred on lawns and parkways in both Syracuse and Brooklyn, New York. Little damage was reported from commercial and farm sources. Within the generally infested area most nurseries are protected by residual insecticides applied for certification purposes, and many farmers apply control treatments when seeding hay and grain crops.

D. Eradication or control

1. Procedures or techniques used

The Division participates with State cooperators and agencies of local governments in the application of control treatments at isolated infestations. In these operations granular dieldrin is spread on the soil surface, usually at the rate of three pounds actual dieldrin per acre. In instances of special concern, a rate of five pounds actual dieldrin is used. On land that is traversable by motorized equipment, a jeep-mounted mechanical distributor is used in making the application. On other land, application is by manually operated seed casters.

2. Accomplishments

In the fall of 1958, treatments were applied at six areas, involving 575.5 acres, and one additional area, involving 63 acres, was treated in the spring of 1959. Fall treatments included all known isolated infestations at Buffalo, Lockport, Niagara Falls, Chittenango, and Syracuse, New York, and Meriden, Connecticut. The spring treatment was applied on turf areas along the Belt Parkway in Brooklyn. All treatments in New York were at the rate of three pounds per acre. At Meriden, Connecticut, five pounds per acre were applied.

E. Regulatory

1. Procedures or techniques used

Federal and State quarantines regulate the interstate and intrastate movement of plant material, soil, sand and gravel from and between regulated areas; and provide for their movement under quarantine certification. Most establishments apply residual certification treatments to growing areas prior to planting and digging operations. Although there is a choice of insecticides, practically all establishments use granular dieldrin for soil surface residual treatments. A dosage of five pounds actual dieldrin per acre is required for certification, except that a three pound rate is authorized on plots for growing one year crops. Under normal cultural methods, the five pound treatment provides continuous certification status for at least five years. Pour-on or dip treatments are available for quick certification of plant and soil products.

2. Accomplishments

During the year, regulated articles with an estimated value of more than 28 million dollars were certified for movement under quarantine regulations.

F. Methods Improvement

1. Work performed

Developmental work on survey traps and lures was done by the Entomology Research Division. Work on certification and control treatments was continued by that Division and the New York Experiment Stations at Geneva and Ithaca.

2. Accomplishments

The newly developed fluorescent black-light trap was available in limited numbers for field use and technical information pertaining to quarantine and control treatments was provided.

G. Other

1. Cooperation received during fiscal year

a. Major contributions received

Cooperating state agencies in New York, Connecticut, and West Virginia participated in program operations. Agencies in other states cooperated in scouting surveys.

Agencies of various communities where control treatments were applied contributed manpower and local support for these activities. Regulated industry cooperated fully in meeting requirements of the quarantine.

The Division of Entomology Research continued its efforts to provide vitally needed improvements on detection methods.

b. Cooperative work needing strengthening another year

Trapping and scouting surveys should be expanded and intensified to detect and delimit infestations. Available Federal funds will not permit further expansion of Division activities and an increase in participation by state agencies would be very helpful.

2. Associated activities and services

a. Program servicing

1. Evaluation

Information concerning this insect and related program activities was made available by program personnel, primarily through contacts with the public, regulated industry, and cooperators.

Current descriptive literature and information on the chafer for general distribution is needed.

III. Recommendations for coming year

A. Survey

Expand and intensify trapping and visual observations.

B. Eradication or control

Continue eradication efforts at all isolated infestations as deemed necessary. Review the status in areas of general infestation, including Brooklyn, and give consideration to methods by which further natural spread from such areas may be prevented.

C. Regulatory

No change in regulatory procedures is believed necessary. A review of current infestation status in New York is necessary for the purpose of considering extension of the regulated area, particularly in the Brooklyn and Syracuse areas.

D. Methods Improvement

Continuing support in the development of a practical and effective trapping device is recommended.

E. Associated activities

A picture sheet with life history, control, and related information should be made available for general distribution prior to the next survey season. A panel type exhibit for display at fairs, shows, meetings, etc., is needed.

EUROPEAN CHAFER

Summary of Field Activities

TABLE #1

Eastern Region

Fiscal Year 1959

STATE A	SURVEY					CONTROL TREATMENTS		CERTIFICATION SERVICES		
	Traps in Use B		Locations Scouted C	Acres of New Infestation		Soil (Acres) F	Foliage (Acres) G	Shippers Serviced H	Total Service Calls I	Est. Value Products Certified J
				Regulated Area D	Non-Regulated Area E					
	*	**								
Connecticut	39	10	1	-	-	10	-	XXX	39	467
New Jersey	-	-	130	-	-	-	-	XXX	-	-
New York	10	61	643	53960	1000	628.5	-	XXX	1835	28103487
Pennsylvania	-	-	10	-	-	-	-	XXX	-	-
West Virginia	-	10	16	-	-	-	-	XXX	-	-
Total from July 1	49	81	800	53960	1000	638.5	-	XXX	1874	28103954
Total from beginning of program	XXX	XXX	XXX	693984	3100	3536.5	-	XXX	6753	107099324

* In use beginning July 1, 1958 (Plastic traps).
**In use ending June 30, 1959 (Black light electric traps).

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Plant Pest Control Division
Central Region

ANNUAL PROGRAM REPORT

GOLDEN NEMATODE

July 1, 1958 - June 30, 1959

In Cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishments for the fiscal year

Commercial potato-growing areas, by States, in the Central Region are surveyed for golden nematode every five years. During the fiscal year 1959, surveys were made in Illinois, Indiana, Kansas, Missouri, Nebraska, and Ohio. In these States 470 soil samples were taken from fields comprising 1,434 acres, and 1,521 samples, representing 21,787 acres, were collected at 158 potato-grading stations. No golden nematode cysts were found in the specimens submitted for identification.

B. Major deviation from work plan

The survey scheduled for Iowa this fiscal year was not conducted. In many areas of the Central Region there has been a rapid decline in the commercial potato acreage, and for that reason the survey was not as extensive in each State as had been anticipated. As an example, Kansas harvested 44,000 acres in 1929, 26,000 acres in 1939, 9,600 acres in 1949, and only 2,500 acres in 1957.

C. Status of program at close of year

To complete the survey in the Central Region, Kentucky is scheduled for survey in fiscal year 1960, and Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin during fiscal year 1961. To date, the golden nematode has not been found in the Central Region.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and direction

The program was planned and directed jointly by personnel of the Plant Pest Control Division and cooperators in each State.

B. Technical assistance

Farmers and potato-growing associations cooperated fully with survey personnel by permitting access to fields and grader sites for the securing of soil samples. State cooperators made the soybean cyst nematode soil laboratories available for washing the samples.

C. Survey

Personnel obtaining soil samples usually consisted of a crew of two or three men. The leader contacted the grower concerned, and directed the survey. The intervals at which the

samples were taken, and the number of bags of soil to be secured per field, were determined at the beginning of the survey. Each bag of soil was marked and numbered so that it could be readily identified. The soil samples collected were periodically delivered to the appropriate soil-washing laboratory. Grader samples were taken and marked in a similar manner, except that they were all secured from piles of dirt and debris at the potato-grading stations.

Soil-washing laboratories were in operation at Springfield, Illinois; Martinsville, Indiana; Kansas State College, Manhattan, Kansas; Sikeston and Hayti, Missouri; Ohio State University and Perry, Ohio. The samples of soil were washed and the floating material was examined under the microscope for the presence of cysts. Any cysts found were placed in vials, marked to correspond with the original sample markings, and forwarded to the golden nematode laboratory at Hicksville, Long Island, New York, for determination. Determinations were then sent back to the respective field laboratory.

In Illinois 62 field samples were collected from 442 acres and 4 samples, representing 16 acres, were collected at one grader site. The survey in Indiana was confined to grader survey only, with 51 samples, representing 2,505 acres, being taken at 10 grader sites. Thirty-seven samples, representing 813 acres, were collected at 9 grader sites in Kansas. Missouri collected 408 field samples, representing 992 acres, compared with 10 samples (100 acres) from one grader site. Nebraska collected 110 samples, representing 22 grader sites, or 11,580 acres. Ohio also collected from grader sites, collecting 1,309 samples, representing 6,773 acres, from 115 of them.

D. Eradication or control

Not applicable.

E. Regulatory

Not applicable.

F. Methods improvement

Not applicable.

G. Other

State cooperators provided space for the soil-washing machines, as well as some laboratory equipment. In many cases State personnel assisted with the laboratory work.

The group of States scheduled for the golden nematode survey next year will make detailed plans for it, since the last

survey was five years ago. Both the State cooperators and Federal personnel will work together in the conduct of the actual field operations.

Publicity during the survey concluded was limited. Personnel of the various State Departments of Agriculture, the Extension Service, and the Plant Pest Control Division gave out information as called upon.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

It is recommended that State and Federal personnel acquaint themselves with the commercial potato-growing areas and the grader sites in each State early in the season. The survey can then be conducted with a minimum of travel and effort.

B. Eradication or control

No recommendations.

C. Regulatory

No recommendations.

D. Methods improvement

Crews should be trained in the survey procedure prior to the start of the work. Details pertaining to the soil-washing laboratory, the storage, and handling of the soil samples should be agreed upon by the State and Federal cooperators.

E. Associated activities

It is recommended that timely publicity be released through the Extension Service on the golden nematode as a pest to potatoes and the damage it causes in the countries where it is found.

Golden Nematode - Accomplishments - Fiscal Year 1959

State	Fields Surveyed			Grader Survey	
	Acres	Samples Collected	Stations Visited	Samples Collected	Acres Represented
Illinois	442	62	1	4	16
Indiana	0	0	10	51	2,505
Kansas	0	0	9	37	813
Missouri	992	408	1	10	100
Nebraska	0	0	22	110	11,580
Ohio	0	0	115	1,309	6,773
Totals	1,434	470	158	1,521	21,787

NOTE: There were no golden nematode infestations in the Central Region.

Summary of Associated Activities - Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Other
		Talks	Slides	Films	Radio	TV		Exhibits	Bulletins	Circulars	Infest. & Posters	Maps
FEDERAL												
Illinois	0	0	0	0	0	0	0	0	0	6	0	0
Indiana	0	0	0	0	0	0	0	0	0	1	0	0
Missouri	0	0	0	0	0	0	1	0	0	10	0	0
Subtotals	0	0	0	0	0	0	1	0	0	17	0	0
COOPERATORS												
None.												
Totals	0	0	0	0	0	0	1	0	0	17	0	0

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.

Golden Nematode - Cooperative Aid Received - Fiscal Year 1959

State	Cash and Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$200	$ 0	$ 0	$ 0	$ 200	$ 0	$ 200
Indiana	400	0	100	0	500	0	500
Kansas	0	0	0	0	0	200	200
Missouri	0	200	0	0	200	300	500
Nebraska	0	0	0	0	0	100	100
Ohio	0	0	0	500	500	1,000	1,500
Totals	$600	$200	$100	$500	$1,400	$1,600	$3,000

*Limited to direct appropriation, allotments from other sources, services and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

Golden Nematode - Expenditures by Source and by Activity - Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvements	Other	Total
CASH & EQUIVALENT*								
PPC Division	$800	$100	$7,800	0	0	$100	0	$8,800
Other Organizations:								
Illinois	0	0	200	0	0	0	0	200
Indiana	0	0	500	0	0	0	0	500
Missouri	0	200	0	0	0	0	0	200
Ohio	0	0	0	0	0	0	500	500
Subtotals	$ 0	$200	$ 700	0	0	0	$500	$1,400
CONTRIBUTED SERVICES**								
Kansas	0	0	200	0	0	0	0	200
Missouri	100	200	0	0	0	0	0	300
Nebraska	0	100	0	0	0	0	0	100
Ohio	500	500	0	0	0	0	0	1,000
Subtotals	$600	$800	$ 200	0	0	0	0	$1,600
GRAND TOTALS	$1,400	$1,100	$8,700	0	0	$100	$500	$11,800

*Direct approp., allotments other sources, services & supplies for which there is a definite replacement value.

**Services incidental to other activities, for which only an estimated value is available.

(*--*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT
GOLDEN NEMATODE CONTROL
July 1, 1958 - June 30, 1959

COOPERATING AGENCIES:

New York State Department of Agriculture and Markets
Maine, New Hampshire, New Jersey and Vermont Depts. of Agriculture
Dept. of Plant Pathology, N.Y.State College of Agriculture, Cornell University
Nematology Section, Crops Research Division
and
Plant Pest Control Division
of
Agricultural Research Service, U. S. Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of year's program activity

A. Accomplishments for the fiscal year

The annual field survey program on Long Island encompassed an area of nearly 30,000 acres of potato land. Over 48,000 soil samples collected were processed and examined microscopically for presence of golden nematode cysts. As a result, eleven new infestations aggregating 631 acres were discovered. Although one of these fields is outside the area of general infestation, it is in close proximity to the isolated infestation on the north fork of Long Island.

In Maine, New Hampshire, Vermont, and New Jersey, 4,797 samples representative of 46,517 acres were collected at 280 grader stations and selected fields. Results were negative.

Considerable progress was made in training Division employees in both survey and laboratory phases of the work. Employees in several states in this and other Regions are now sufficiently trained to conduct future surveys with only occasional assistance from the Hicksville Laboratory.

B. Major deviation from work plan

Surveys scheduled for the Fall of 1958 in Massachusetts, Connecticut, and Rhode Island were postponed one year.

C. Status of program at close of year

Infestations in the United States are known only in Nassau and Suffolk Counties, Long Island, New York. Confirmed infested acreage as of June 30, 1959 is 14,338 acres (Table #3). Removed from agricultural use are 8,424 infested acres which have gone into real estate development, leaving a remainder of 5,914 acres subject to regulation as set forth in New York State Quarantine No. 10 (Table #3).

II. Program activity during fiscal year

A. Planning and direction

Program activities in each state were planned by Division Supervisors and officials of cooperating state agencies. Control and regulatory operations in New York were planned and directed by the New York State Department of Agriculture and Markets and cooperating Division personnel. Survey and laboratory operations were planned and directed by the Division Regional Staff Assistant in charge of the Hicksville Laboratory.

B. Technical Assistance

1. Technical assistance was provided to cooperators, regulated growers, shippers, carriers, and the public in connection with regulatory, control, and survey phases of the work. Technical training of Division personnel in this and other regions was stressed so that future surveys might be conducted independently on a regional-state basis. Substantial technical assistance was provided to Division personnel in other regions by making identifications of numerous specimens recovered on their surveys. Over 8,000 such determinations were made this year.

2. Cooperating research units of the New York State College of Agriculture, Cornell University, and the Nematology Section of the Crops Research Division, ARS provided research data and related technical assistance.

C. Survey

1. Procedures or techniques used

Surveys were conducted in accordance with procedures and techniques described in the 1954 edition of the Golden Nematode Handbook.

2. Accomplishments

The annual fall survey on Long Island, New York, was started September 17 and completed November 28, 1958. 20,875 soil samples were collected from 10,631 acres of potato land in Nassau and western Suffolk Counties and operationally-exposed potato fields in eastern Suffolk County. Laboratory processing of samples collected revealed initial infestation on one property in Nassau County, nine properties in western Suffolk County and one property in eastern Suffolk County, totalling 631.30 acres (Tables #1 and #2).

The annual spring survey on Long Island was started on March 30 and ended June 19, 1959. 25,180 soil samples were collected from 18,614 acres of potato land in eastern Suffolk County. (See map)

In addition to the regularly scheduled surveys, confirmatory surveys were necessary to verify infestations on eleven new properties. Samples were also collected from a known infested field selected for soil fumigation experiments for the purpose of determining cyst viability percentages. A similar survey was conducted on an experimental field maintained at Seaford by Cornell University.

Both field and grader surveys were conducted in Maine, New Hampshire, Vermont and New Jersey. Samples collected in

New Jersey were processed at a temporary laboratory in Trenton. Those collected in the northern New England States were processed in State facilities at Presque Isle, Maine, and at the Division's storehouse in Nashua, New Hampshire.

3. Statement or table of pest damage

During recent years golden nematode populations on Long Island have been held below crop damage levels by means of intensive periodic surveys, coupled with the withholding of infested lands from host crop production.

D. Eradication or control

1. Procedures or techniques used

The basic method of control is cultural and consists of withholding infested land from host crop production.

2. Accomplishments

To hold cyst populations to the lowest possible level, 498.40 acres of known infested land were withheld from host crop production. For withholding this acreage from potato production, farmers were compensated by the New York Department of Agriculture and Markets at the rate of $60.00 per acre. Payments for this purpose amounted to $29,904.00.

E. Regulatory

1. Procedures or techniques used

There is no Federal quarantine pertaining to this pest. Authority for Federal participation on the program is contained in Public Law No. 645 - 80th Congress and the Plant Quarantine Act.

New York State Golden Nematode Quarantine No. 10 quarantines the counties of Nassau and Suffolk on Long Island, and regulates the movement of soil, potatoes, grader debris, root crops, farm equipment, and other articles likely to spread infestation. The growing of seed potatoes is prohibited.

2. Accomplishments

Potato movement and grader dirt disposal was supervised at 83 commercial grading stations operating under agreement. A total of 20,404 loads of regulated topsoil was moved under permit from 40 regulated locations. Twenty-two permits were issued under signed agreements to cover

the movement of root crops grown on regulated land. Approximately 399 pieces of contaminated farm machinery, vehicles, bulldozers, miscellaneous hand tools, and 500 feet of irrigation pipe were steam cleaned; and 300 picking bags were fumigated with methyl bromide.

F. Methods Improvement

1. Work performed

There were no significant changes in program procedures during the year. Minor efforts to improve present field fumigation methods and equipment were continued. To expedite sampling, minor changes were made in survey and laboratory procedures.

2. Accomplishments

Preliminary steps were taken to install dust-catching containers at soil washing machines in an effort to reduce the amount of dust in the laboratory.

G. Other

1. Cooperation received during fiscal year

The New York State Department of Agriculture and Markets participated in the suppression and prevention of spread phases of the cooperative program by providing manpower, equipment, and materials. The New York State College of Agriculture, Cornell University, continued to maintain a special laboratory at Seaford where research activities were conducted. Nematologists of the Crops Research Division stationed at the same laboratory also participated in research. Growers, shippers, and transporters likewise cooperated on various phases of the program.

In Maine, New Hampshire, Vermont, and New Jersey, cooperating state agencies participated in planning surveys and provided temporary laboratory space and manpower to assist with survey operations.

2. Associated activities and services

Golden nematode displays were prepared for two exhibits this year. One exhibit was presented at a Science Fair sponsored by the public schools of Carle Place, Long Island. The other display was set up at the Hicksville Laboratory for pupils from Seaford, New York. The Science Fair was unique in that selected science students from the different high schools were assigned to help man the exhibits.

The student-teacher group assigned to this exhibit made several visits to the Hicksville Laboratory in order to become acquainted with the program objective and operational techniques.

Substantial use was made of the golden nematode motion picture, circulars, leaflets, and the Handbook of Procedures in presenting information to farmers, nurserymen, state officials, students, and the general public.

III. Recommendations for the coming year

A. Survey

Long Island - Field soil survey should be continued on an annual basis in Nassau and Suffolk Counties. The 1960 spring survey should include the area between Port Jefferson and Riverhead in Suffolk County. (Refer to Map #1)

Outside Long Island - The following survey schedule is recommended to strengthen the program in the important potato growing areas in this region, particularly in upstate New York, New Jersey, and the Delmarva Peninsula, since many potato farms in these states are operated by former Long Island growers:

Maine, upstate New York, New Jersey, Pennsylvania, Maryland, Delaware and Virginia	Yearly
New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, and West Virginia	Every 3rd. Year

B. Eradication or Control

Efforts to develop an effective and practical eradication treatment should be continued and expanded in an agressive manner.

C. Regulatory

Quarantine and control measures now in effect in New York State should be continued in cooperation with the New York State Department of Agriculture and Markets, with the Division participating in an active manner as in the past.

D. Methods Improvement

Plans for methods improvement work should be developed each year in advance with participating agencies concurring in the programs to be undertaken. In consideration of surveys accomplished on a

national basis since 1944 and the lack of widespread infestation, a closely coordinated all-out research and methods development effort to develop eradication techniques is of primary importance. It is recommended that those phases of work underway be reviewed for the purpose of increasing cooperative endeavors pointed toward chemical or other feasible eradicative measures at the earliest practicable date. Special emphasis should be given to type of applicators, methods of application, a satisfactory surface seal, and effective fumigants.

E. Associated activities

A prefabricated golden nematode exhibit is still needed so that we can participate in expositions without taking time to prepare a special exhibit for each showing.

TABLE #1

PROPERTIES FOUND INFESTED WITH GOLDEN NEMATODE
July 1, 1958 to June 30, 1959

NASSAU COUNTY:

Property No.	Operator	Acres	
22-J-803	John Filasky	16.00	16.00

SUFFOLK COUNTY

1-D-11	Henry Brand	6.75	
3-A-9,10,11	J. J. Rhodes	92.20	
9-A-18,19	A. Schmidt	50.92	
9-B-22	Wm. Schneider	9.50	
9-B-34,42	Wm. Erb	189.75	
10-B-1	Schneider Bros.	60.83	
10-B-12	Leonard Wesnofske	99.25	
14-B-21,24,28	Gustav Johnson	77.00	
15-A-34	Fred Wicks	12.00	
37-A-56	John Krupski	17.10	
			615.30
	Total Nassau and Suffolk Counties		631.30 Acres

TABLE #2

SUMMARY OF PROPERTIES AND ACREAGE ON LONG ISLAND, N.Y.
FOUND TO CONTAIN GOLDEN NEMATODE INFESTATION

June 30, 1959

	NASSAU COUNTY		SUFFOLK COUNTY		TOTALS	
YEAR	No. of Properties	No. of Acres	No. of Properties	No. of Acres	No. of Properties	No. of Acres
1941	2	115.66			2	115.66
1942	9	541.86			9	541.86
1943	8	437.36			8	437.36
1944	5	142.98			5	142.98
1945	5	165.88			5	165.88
1946	41	1,656.50			41	1,656.50
1947	52	2,793.28	1	30.00	53	2,823.28
1948	27	1,034.66	6	216.95	33	1,251.61
1949	22	663.00	7	350.15	29	1,013.15
1950	22	660.56	6	232.88	28	893.44
1951	16	544.75	10	302.80	26	847.55
1952	13	261.12	12	790.61	25	1,051.73
1953	8	167.43	19	989.20	27	1,156.63
1954	3	143.24	5	266.00	8	409.24
1955	2	130.00	3	85.30	5	215.30
1956			3	153.00	3	153.00
1957	1	7.92	7	263.70	8	271.62
1958	2	181.00	4	322.94	6	503.94
1959	1	16.00	10	615.30	11	631.30
TOTALS	239	9,663.20	93	4,618.83	332	14,282.03

TABLE #3

STATUS OF GOLDEN NEMATODE INFESTATION
as of
June 30, 1959

Confirmed Acreage Long Island	14,338.03	
Less: Developed for Real Estate	8,423.98	
Remaining Confirmed Acreage Available to Agriculture		5,914.05

Classification of Land Available to Agriculture

Nassau County

Confirmed Acreage	9,719.20	
Less: Developed for Real Estate	7,811.90	
Remaining Confirmed Acreage Available to Agriculture		1,907.30

Suffolk County

Confirmed Acreage	4,618.83	
Less: Developed for Real Estate	612.08	
Remaining Confirmed Acreage Available to Agriculture		4,006.75

Remaining Confirmed Acreage Available to Agriculture Nassau and Suffolk Counties	5,914.05

Quarantine "A" Land:

Nassau County	1,078.67	
Suffolk County	1,814.98	
Total "A" Land:		2,893.65

Quarantine "B" Land:

Nassau County	828.63	
Suffolk County	2,191.77	
Total "B" Land:		3,020.40

Total "A" and "B" Land - - - - - - - - - - - - - - 5,914.05

TABLE #4

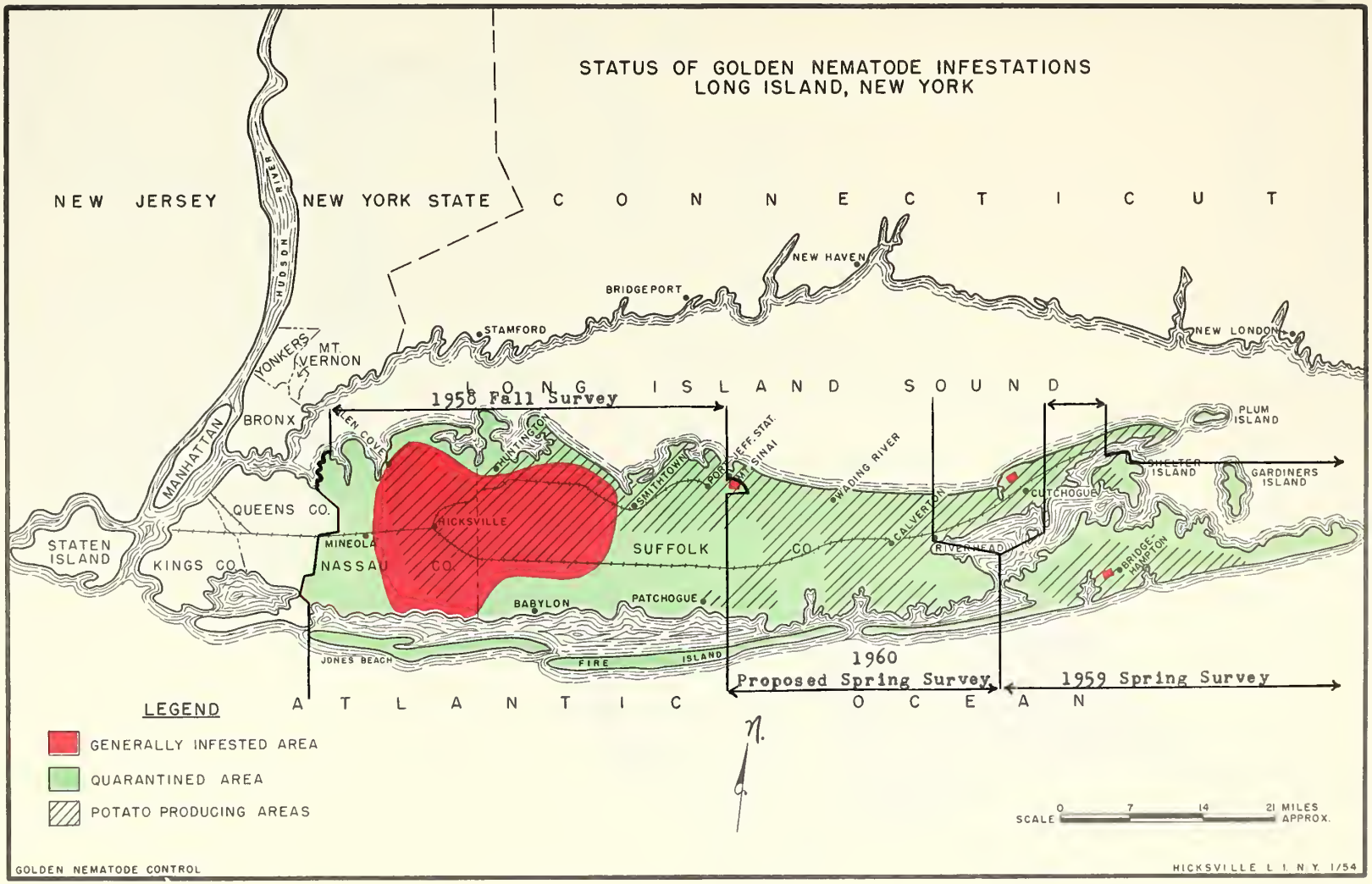
GOLDEN NEMATODE

EASTERN REGION — FISCAL YEAR 1959

AREAS SURVEYED	FIELD SURVEYED		GRADER SURVEY			INFESTATIONS		TOPSOIL MOVEMENT		Total Service Calls
	Acres	Samples Collected	Stations Visited	Samples Collected	Acres Represented	Properties	Acres	Pits Operating	Loads Moved	
A	B	C	D	E	F	G	H	I	J	K
Long Island										
Nassau County	1226	3423						30	15359	
Suffolk County	28671	44648						10	5045	
Total from July 1,1958	29897	48071				11	*631		20404	4698
Total from beginning of Program	561913	976289				332	*14338		441938	7742
Other Areas by States										
Maine	33387	2722	89	544	4923					
New Hampshire	10	7	32	132	1083					
New Jersey	384	526	138	705	5509					
Vermont	33	16	21	145	1188					
Total from July 1	33814	3271	280	1526	12703					
Total from beginning of Program (L. I. excluded)	141868	95360	11049	96367	622687					

On December and June reports show:
(a) Acres removed by housing developments 8424 (from beginning of program).
(b) Acres "A" land 2894 ("A" land is that portion of field in which golden nematode cysts have been found.)
(c) Acres "B" land 3020 ("B" land is that portion of an infested field in which golden nematode cysts have not been found).

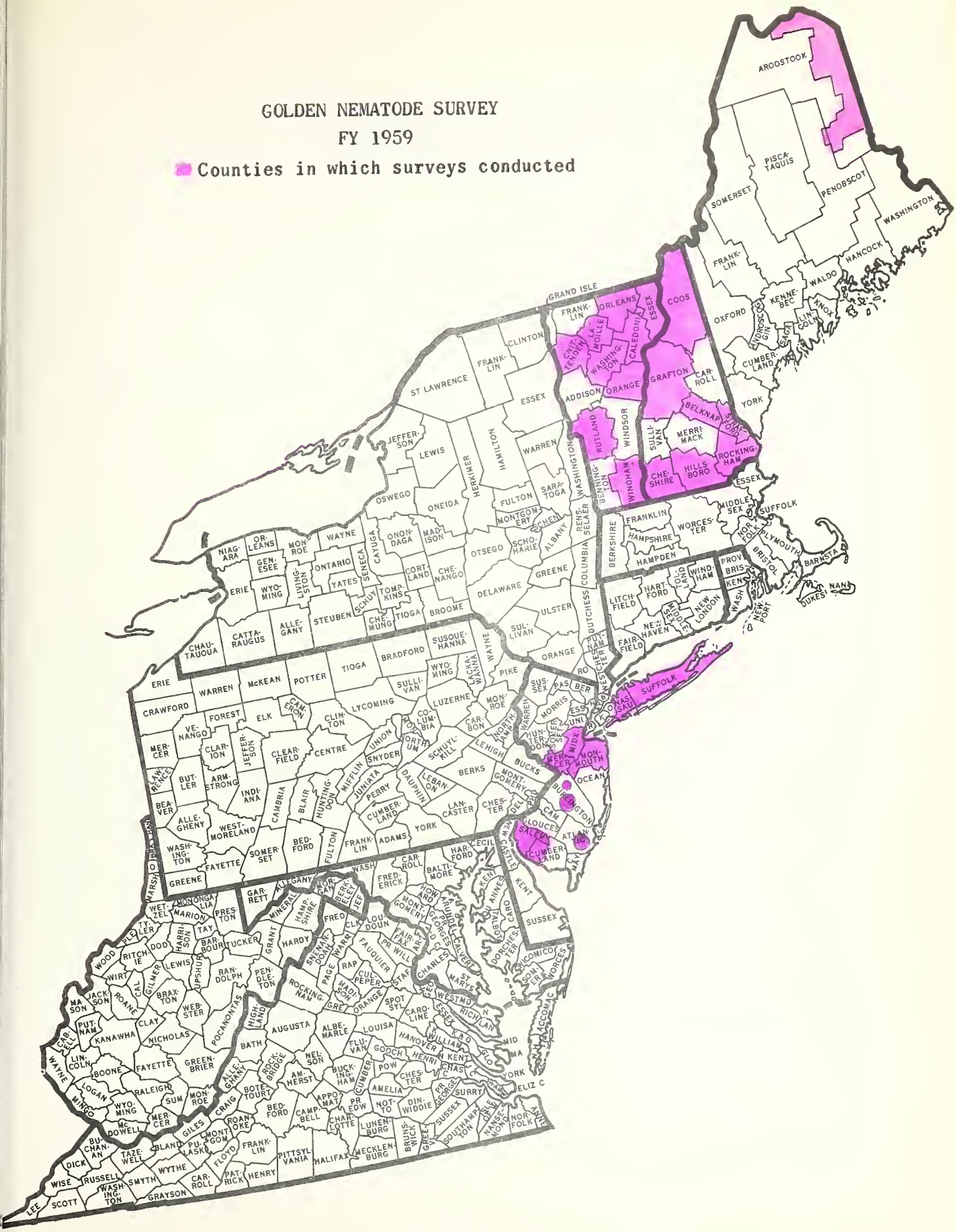
*Breakdown of infested acreage into "A" and "B" land has been determined.
Corrections are based on latest figures on acreage from the tax office.


STATUS OF GOLDEN NEMATODE INFESTATIONS
LONG ISLAND, NEW YORK
NEW JERSEY
NEW YORK STATE
C O N N E C T I C U T
HUDSON RIVER
NEW HAVEN
BRIDGEPORT
STAMFORD
NEW LONDON
YONKERS
MT. VERNON
L O N G I S L A N D S O U N D
1958 Fall Survey
BRONX
MANHATTAN
QUEENS CO.
KINGS CO.
STATEN ISLAND
NASSAU CO.
MINEOLA
HICKSVILLE
HUNTINGTON
EAST NORWICH
GLEN COVE
SMITHTOWN
PORT JEFF.
STA.
SINAI
WADING RIVER
CALVERTON
RIVERHEAD
CUTCHOGUE
PLUM ISLAND
SHELTER ISLAND
GARDINERS ISLAND
SUFFOLK CO.
BRIDGE-HAMPTON
BABYLON
PATCHOGUE
JONES BEACH
FIRE ISLAND
1960
Proposed Spring Survey
1959 Spring Survey
A T L A N T I C O C E A N
LEGEND
GENERALLY INFESTED AREA
QUARANTINED AREA
POTATO PRODUCING AREAS
N.
SCALE 0 7 14 21 MILES APPROX.
GOLDEN NEMATODE CONTROL
HICKSVILLE L. I. N. Y. 1/54

GPO 945935

GOLDEN NEMATODE SURVEY
FY 1959

Counties in which surveys conducted


AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
KENNEBEC
OXFORD
LINCOLN
KNOX
CUMBERLAND
YORK
COOS
GRAFTON
CARROLL
BELKNAP
MERRIMACK
ROCKINGHAM
STRAFFORD
HILLSBORO
CHESHIRE
SULLIVAN
ESSEX
ORLEANS
CALEDONIA
WASHINGTON
ORANGE
WINDSOR
RUTLAND
ADDISON
GRAND ISLE
FRANKLIN
CLINTON
ST LAWRENCE
JEFFERSON
LEWIS
HERKIMER
HAMILTON
WARREN
SARATOGA
FULTON
OSWEGO
ONEIDA
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
WASHINGTON
BENNINGTON
WINDHAM
WINDSOR
BERKSHIRE
FRANKLIN
HAMPSHIRE
HAMPDEN
WORCESTER
MIDDLESEX
ESSEX
SUFFOLK
NORFOLK
PLYMOUTH
BRISTOL
BARNSTABLE
DUKES
NANTUCKET
PROVIDENCE
KENT
WASHINGTON
NEWPORT
LITCHFIELD
HARTFORD
NEW LONDON
NEW HAVEN
FAIRFIELD
DUTCHESS
PUTNAM
ORANGE
ROCKLAND
WESTCHESTER
SULLIVAN
ULSTER
GREENE
DELAWARE
COLUMBIA
SCHOHARIE
OTSEGO
CHENANGO
CORTLAND
MADISON
ONONDAGA
CAYUGA
SENECA
YATES
ONTARIO
WAYNE
MONROE
LIVINGSTON
WYOMING
GENESEE
ORLEANS
NIAGARA
ERIE
CHAUTAUQUA
CATTARAUGUS
ALLEGANY
STEUBEN
CHEMUNG
TIOGA
BROOME
SUSQUEHANNA
WYOMING
LACKAWANNA
PIKE
SUSSEX
BERGEN
PASSAIC
ESSEX
UNION
MORRIS
WARREN
HUNTERDON
SOMERSET
MIDDLESEX
MONMOUTH
OCEAN
BURLINGTON
CAMDEN
GLOUCESTER
ATLANTIC
CUMBERLAND
SALEM
CAPE MAY
MERCER
BUCKS
MONTGOMERY
BERKS
LEHIGH
NORTHAMPTON
CARBON
MONROE
LUZERNE
COLUMBIA
SCHUYLKILL
DAUPHIN
LEBANON
LANCASTER
CHESTER
DELAWARE
YORK
ADAMS
FRANKLIN
CUMBERLAND
PERRY
JUNIATA
MIFFLIN
SNYDER
UNION
NORTHUMBERLAND
LYCOMING
CLINTON
POTTER
TIOGA
BRADFORD
SULLIVAN
WYOMING
SUSQUEHANNA
WAYNE
ERIE
WARREN
MCKEAN
CRAWFORD
FOREST
ELK
CAMERON
VENANGO
MERCER
CLARION
JEFFERSON
CLEARFIELD
CENTRE
BUTLER
ARMSTRONG
INDIANA
CAMBRIA
BLAIR
HUNTINGDON
BEAVER
ALLEGHENY
WESTMORELAND
WASHINGTON
FAYETTE
SOMERSET
BEDFORD
FULTON
GREENE
MARSHALL
OHIO
BROOKE
HANCOCK
WETZEL
MARION
MONONGALIA
PRESTON
TYLER
PLEASANTS
RITCHIE
DODDRIDGE
HARRISON
TAYLOR
BARBOUR
TUCKER
GRANT
HARDY
MINERAL
HAMPSHIRE
GARRETT
ALLEGANY
MORGAN
BERKELEY
JEFFERSON
FREDERICK
CARROLL
BALTIMORE
HARFORD
CECIL
KENT
QUEEN ANNES
CARO LINE
TALBOT
DORCHESTER
WICOMICO
SOMERSET
WORCESTER
SUSSEX
WOOD
WIRT
JACKSON
ROANE
CALHOUN
GILMER
LEWIS
RANDOLPH
TUCKER
PENDLETON
HIGHLAND
BATH
ALLEGHANY
BOTETOURT
CRAIG
ROANOKE
FRANKLIN
PITTSYLVANIA
HALIFAX
MECKLENBURG
BRUNSWICK
GREENSVILLE
SOUTHAMPTON
NANSEMOND
NORFOLK
PRINCE GEORGE
SURRY
SUSSEX
DINWIDDIE
NOTTOWAY
PRINCE EDWARD
CUMBERLAND
AMELIA
CHESTERFIELD
POWHATAN
GOOCHLAND
HENRICO
CHARLES CITY
NEW KENT
JAMES CITY
YORK
ELIZABETH CITY
WILLIAMSBURG
HANOVER
KING WILLIAM
KING & QUEEN
ESSEX
LANCASTER
RICHMOND
WESTMORELAND
KING GEORGE
STAFFORD
SPOTSYLVANIA
ORANGE
MADISON
GREENE
CULPEPER
RAPPAHANNOCK
PAGE
WARREN
SHENANDOAH
FREDERICK
CLARKE
LOUDOUN
FAUQUIER
PRINCE WILLIAM
FAIRFAX
ARLINGTON
ALEXANDRIA
CHARLES
CALVERT
ST MARYS
MONTGOMERY
PRINCE GEORGES
ANNE ARUNDEL
HOWARD
CAROLINE
DORCHESTER
TALBOT
QUEEN ANNES
KENT
CECIL
HARFORD
BALTIMORE
CARROLL
FREDERICK
WASHINGTON
MORGAN
BERKELEY
JEFFERSON
GARRETT
ALLEGANY
MINERAL
HAMPSHIRE
HARDY
GRANT
TUCKER
BARBOUR
HARRISON
TAYLOR
DODDRIDGE
TYLER
PLEASANTS
RITCHIE

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

GOLDEN NEMATODE

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

The golden nematode is not known to exist in the Southern Region, but surveys are made at 5-year intervals in the principal potato producing areas. This fiscal year, surveys were made in 4 states, but no indication of this pest was found.

B. Major deviation from Work Plan, if any

None

C. Status of Program at close of year

No known infestations in Southern Region.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

Area and district personnel reviewed the over-all acreage to be surveyed in the various counties, and plans for arrangement of equipment, supplies, and personnel were formulated to cover the major areas during the harvesting period or shortly thereafter before heavy weed growth developed.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Technical assistance provided the growers evolved around the purpose of the survey as well as necessity of early detection of the pest.

2. Technical assistance provided to program by cooperating agencies

The Extension Service through the efforts of the County Agricultural Agents provided information and data as to acreages planted by growers as well as their locations in the various counties.

C. Survey

1. Procedures or techniques used

a. Field

Soil samples were collected wherever possible from potato fields that had a record of five consecutive years of plantings. Where this was not possible, fields that had been planted consecutively with potatoes, eggplant, or tomatoes were selected as the next best approach. Growers were questioned as to their observations during the growing season relative to any abnormal growth or damage that may have occurred prior to taking of field soil samples. Samples were normally collected by walking the fields diagonally and across the ends and scooping up small samples, approximating six pounds per sample in a 40-acre field. Samples were also collected around old potato grading sheds and from locations where potato harvesting and cultivating machinery would be stored for extended periods.

b. Laboratory

All soil samples were stored at the Lake Alfred Laboratory, but had not been processed by the close of the 1959 fiscal year.

2. Accomplishments

In the field surveys, 1521 soil samples were collected from 34,315 acres in 24 counties of 4 states, and in the grader survey of 134 stations, 447 samples representing 13,003 acres were collected. No evidence of infestation was found.

3. Statement or table of pest damage

None.

D. Eradication or Control

Not applicable.

E. Regulatory

Not applicable.

F. Methods Improvement

None.

G. Other

1. Cooperation received during fiscal year

a. List major contributions received and show importance to program (other than funds).

County Agricultural Agents and potato growers cooperated in supplying information relative to major areas of production, as well as location of individual growers and the data as to fields being consecutively planted to potatoes or closely related hosts for considerable lengths of time.

b. Cooperative work needing strengthening another year

Additional efforts should be made by the Extension Service to provide growers with more data in the form of leaflets or bulletins relative to damage that can be caused by establishment of the pest. Also more literature and picture leaflets pertaining to visual symptoms should be provided in order for growers to be better acquainted to report symptoms of the pest to the local State and Plant Pest Control Division personnel and agricultural representatives.

III. Recommendations for coming year

A. Survey

Providing all soil samples when processed are negative, sampling should be alternated on desirable fields that were not sampled in the past growing season and sampling should be done around potato grading houses.

B. Eradication or control

Not applicable.

C. Regulatory

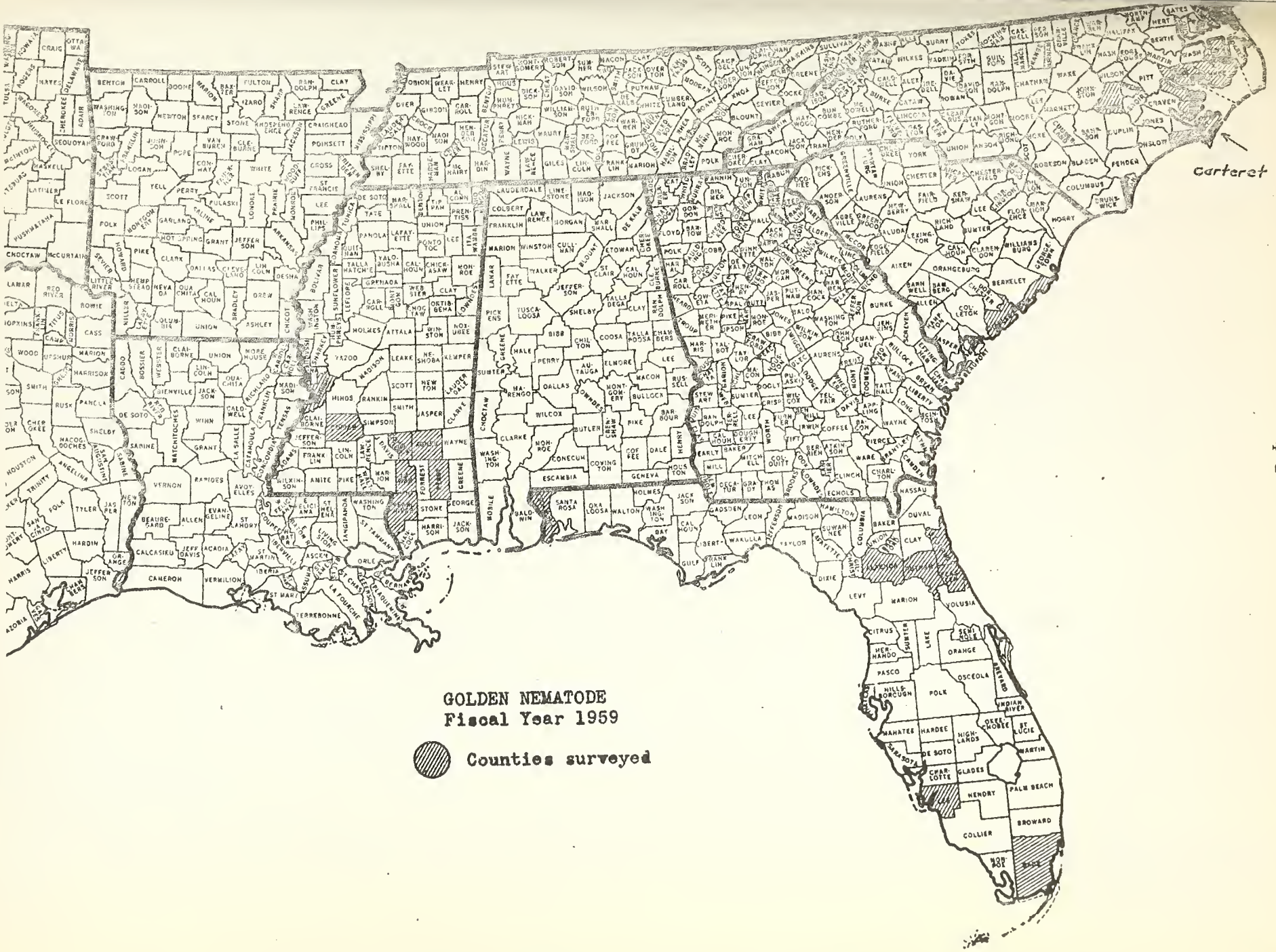
Not applicable.

D. Methods Improvement

None.

E. Associated Activities

None.


Carteret
GOLDEN NEMATODE
Fiscal Year 1959
Counties surveyed

GOLDEN NEMATODE

Region: Southern | Prepared by:

Period (*Designate: Month, 1-15, 16-31, or 1-31*): Fiscal Year 1959 | Date Prepared:

AREAS SURVEYED (A)	FIELD SURVEYED: Acres (B)	FIELD SURVEYED: Samples Collected (C)	GRADER SURVEY: Stations Visited (D)	GRADER SURVEY: Samples Collected (E)	GRADER SURVEY: Acres Represented (F)	INFESTATIONS: Properties (G)	INFESTATIONS: Acres (H)	TOPSOIL MOVEMENT: Pits Operating (I)	TOPSOIL MOVEMENT: Loads Moved (J)	TOTAL SERVICE CALLS (K)
Long Island Nassau County Suffolk County										
Total This Period										
Total From July 1										
Total From Beginning of Program										
Other Areas by States										
Florida	33,451	1,425	0	0	0					
Mississippi	225	46	4	4	3					
N. Carolina	639	50	80	243	7,000					
S. Carolina	0	0	50	200	6,000					
Total This Period										
Total From July 1	34,315	1,521	134	447	13,003					
Total From Beginning of Program - L. I. Excluded										

On December and June reports show:

(a) Acres removed by housing developments _____ (from beginning of program).

(b) Acres "A" land _____ ("A" land is that portion of field in which golden nematode cysts have been found.)

(c) Acres "B" land _____ ("B" land is that portion of an infested field in which golden nematode cysts have *not* been found.

PPC Form 7-5
July 1958

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

_____

GOLDEN NEMATODE

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

_____

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

GOLDEN NEMATODE

July 1, 1958 - June 30, 1959

In cooperation with
County, State, Federal, and Local Agencies

December 1, 1959

Oakland, California

Jim R. Dutton

Regional Supervisor

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HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishments for the Fiscal Year

At 5-year intervals all commercial potato-growing areas in the eleven Western States are systematically surveyed for golden nematode. Such a survey was initiated late in fiscal year 1958 and completed in fiscal year 1959.

During the year a total of 16,851 soil samples was collected, mostly from potato grader sites, storage cellars, and warehouses. These were composite samples based on 1 sample per 20 acres of planted potatoes and represented a total of 297,855 acres of potatoes. All samples were processed and no golden nematode cysts were found.

Major Deviation from Work Plan

None

Status of Program at Close of Year

Survey was completed as planned and on schedule.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

Plant Pest Control Division personnel worked very closely with responsible agencies in the State Departments of Agriculture in planning and directing the work. California County Agricultural Commissions in the major potato counties also actively participated.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Purpose of the program and field procedures were explained to farmers, grader operators, and other interested parties.

Technical assistance provided to program by cooperating agencies

Plant Pest Control Division personnel stationed at Long Island, New York, trained two Western Region Division

employees in laboratory techniques and assigned one man for two weeks to give "on-the-ground" instruction when the program first got under way. They also provided a great deal of assistance in the original planning of survey procedures, both in obtaining soil samples and in establishing temporary field processing stations.

California State Department of Agriculture, Bureau of Plant Pathology, assigned one of its trained nematologists to assist for two weeks in processing soil samples collected in that State.

State Departments of Agriculture in Oregon, Washington, California, Montana, and Idaho assisted by collecting soil samples at potato grader loading or storage sites.

All states assisted by making available adequate soil sample storage and processing facilities.

Survey

Procedures or techniques used

Field

Collecting, labeling and storing of soil samples was done in accordance with accepted procedures as outlined in the Golden Nematode Manual. The collection of composite samples from piles of soil and debris at potato grader, storage, and loading sites is considered to be the most effective sampling method for the detection of golden nematode, outside the known infested area on Long Island. Most of the soil samples obtained in the Western States were from such locations. Very few samples were taken.

Laboratory

Portable soil washing machines were made in Oakland using blueprints provided by the Division's Long Island Laboratory. Soil washers and other necessary equipment were moved from state to state to process soil samples which had been concentrated at convenient locations.

Cooperating state agencies provided inside facilities for microscopic examination of flotsam, as well as necessary electricity, water, and other services.

Disposal pits were dug at each processing point where excess soil and oil debris were concentrated. At the conclusion of each operation, the pit was fumigated with methyl bromide at the rate of 5 pounds per 1,000 cubic feet. After treatment the pits were filled with soil.

Accomplishments

Representative soil samples from all commercial potato-growing areas in the eleven Western States were collected and processed as planned. No golden nematode cysts were found.

Statement of crop losses

Not applicable

Eradication or Control

Not applicable

Regulatory

Not applicable

Methods Improvement

Except for adjustments in application as personnel became more experienced, prescribed methods for field and laboratory procedures were followed. No improved methods were developed nor deemed necessary.

Other

Cooperation received during fiscal year

Excellent cooperation and assistance were provided by states, counties, and individuals concerned.

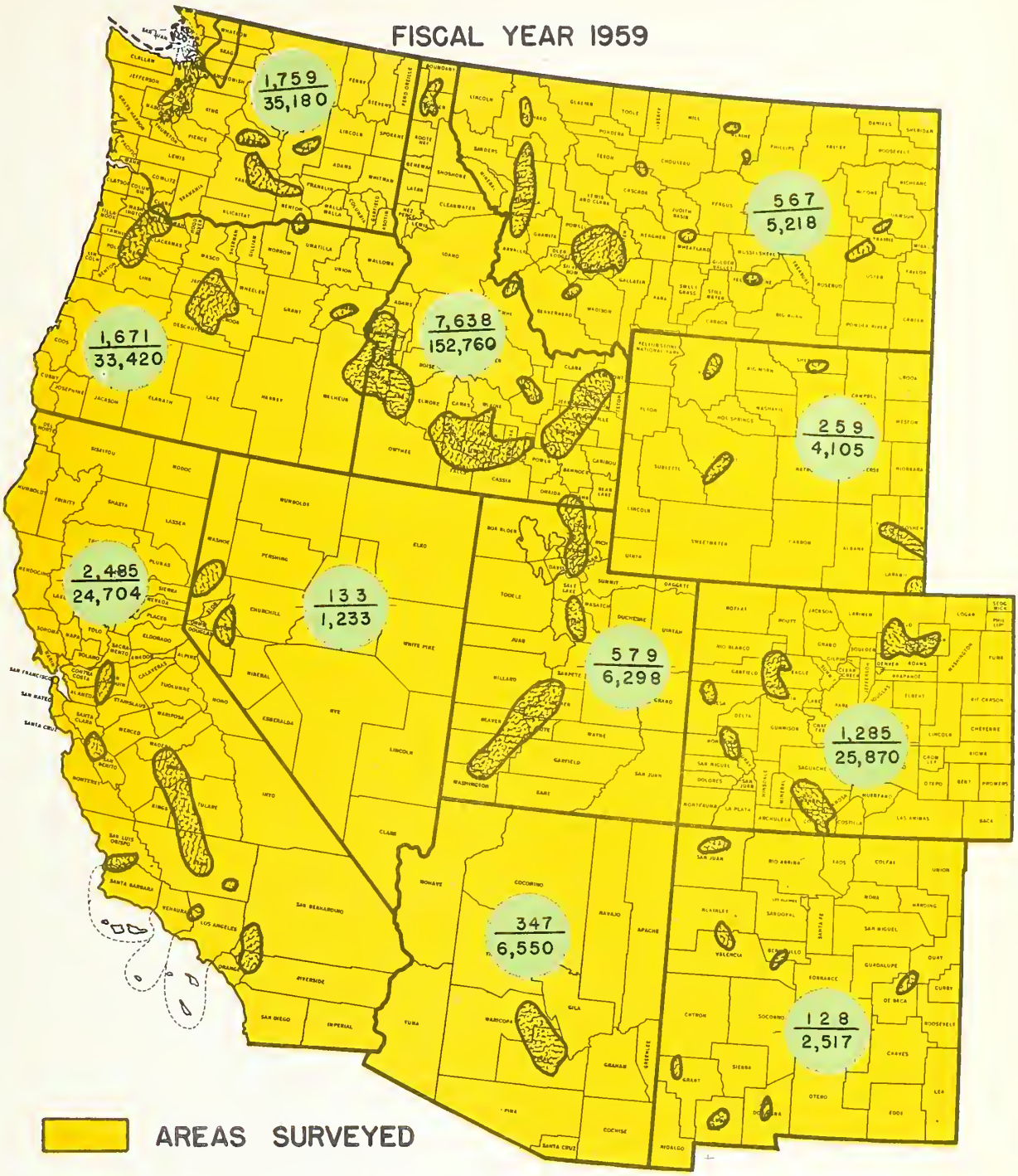
Assistance was provided in the form of manpower, storage, and processing facilities.

RECOMMENDATIONS FOR COMING YEAR

Our 5-year interval survey schedule provides that we repeat the sampling of all commercial potato-growing areas in 1963. Certainly the experience gained by all our personnel this year will put us in a position to perform more effectively when that time comes. In the meantime, we shall be alert to possible golden nematode infestations in the Region.

GOLDEN NEMATODE PROGRAM

FISCAL YEAR 1959



AREAS SURVEYED

PRINCIPAL POTATO PRODUCING AREAS

0/0

UPPER FIGURE: TOTAL SOIL SAMPLES WASHED

LOWER FIGURE: ACRES OF POTATOES REPRESENTED

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
4173 MACARTHUR BOULEVARD
OAKLAND 19, CALIFORNIA

OCTOBER 1959

GPO 979101

SUMMARY OF ASSOCIATED ACTIVITIES

Golden Nematode

Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.	Infest. Maps & Posters	
Nevada	1	1										1
Total	1	1										1

* Written by Federal personnel for release direct or through cooperators.

SURVEY SUMMARY

Golden Nematode

Fiscal Year 1959

State	No. Counties in Which Potatoes are Grown Commercially	No. Samples Collected	Acres Represented	Results
Arizona	3	347	6,550	Negative
California	5	2,485	24,704	"
Colorado	13	1,285	25,870	"
Idaho	20	7,638	152,760	"
Montana	19	567	5,218	"
Nevada	8	133	1,233	"
New Mexico	6	128	2,517	"
Oregon	6	1,671	33,420	"
Utah	15	579	6,298	"
Washington	8	1,759	35,180	"
Wyoming	4	259	4,105	"
Totals	107	16,851	297,855	

EXPENDITURES BY SOURCE AND ACTIVITY

Golden Nematode

Fiscal Year 1959

	1	2	3	4	5	6	7	8
Source of Cash & Equivalent*	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
Plant Pest Control Division	$ 2,815	$ 620	$10,615				$	$14,050
Other Organizations (Name)								
State Depts. of Agriculture	120	15	740					875
Subtotal Other Organizations	120	15	740					875
Total (of PPC & Other)	2,935	635	11,355					14,925
Contributed Services**								
State Depts. of Agriculture	490	1,180	1,725				30	3,425
County Depts. of Agriculture	150	750					50	950
Total	640	1,930	1,725				80	4,375
Grand Total	$ 3,575	$ 2,565	$13,080				$ 80	$19,300

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

COOPERATIVE AID RECEIVED

Golden Nematode

Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
	$	$	$	$	$	$	$	
State Depts. of Agriculture								
Idaho		300			300		300	
Nevada		290			290		290	
Utah		285			285	25	310	
California						1,100	1,100	
Colorado						100	100	
Montana						1,050	1,050	
New Mexico						30	30	
Oregon						500	500	
Washington						500	500	
Wyoming						120	120	
County Depts. of Agriculture								
California						900	900	
Montana						50	50	
Total	$	$ 875	$	$	$ 875	$ 4,375	$ 5,250	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER CONTROL

July 1, 1958 - June 30, 1959

In Cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

Cooperatively conducted rangeland programs, involving the treatment of some 137,082 acres of grasshopper-infested land in the States of Kansas, Nebraska, and South Dakota were successfully completed during this fiscal year. The acreage, by States, was:

Kansas - 79,556, L.U. Forest Service
8,307, private land

Nebraska 41,369, private land

S. Dakota 7,850, Forest Service, Black Hills National Forest

During July and early August, under the supervision of Plant Pest Control personnel, farmers in the wheat-growing sections of Bennett County, South Dakota, voluntarily treated an estimated 51,000 acres of roadsides, fence rows, and headlands to protect fall planting from Melanoplus bilituratus.

In North Dakota, a very successful farmer-county-state voluntary grasshopper program was being completed at the end of the fiscal year.

Elsewhere in the crop areas of the Region threatened with grasshoppers, voluntary control measures by interested landowners and operators kept crop damage very low. These areas included limited acreages in Wisconsin, Nebraska, Kansas, Minnesota, Illinois, Iowa, South Dakota, and Missouri.

B. Major deviations from work plan

Anticipated cooperative control on some 135,000 acres of private rangeland in western Nebraska did not materialize, probably due to a combination of very dry weather following egg deposition in the fall, predators and parasites during the winter, and cold, wet weather at time of hatch in the spring.

Melanoplus bilituratus flights into west-central South Dakota during early July 1958 developed into a larger control problem at the close of this fiscal year than was originally anticipated. Total acreage treated under voluntary farmer-rancher programs was approximately 10,000 acres as of June 30, 1959.

C. Status of program at close of year

The cooperative control activities begun prior to June 30, 1959, in west-central South Dakota and concluded during the first month

of fiscal year 1960 will be reported in next year's report.

All voluntary control work extending into fiscal year 1960 is progressing normally and will also be reported in next year's report.

II. PROGRAM ACTIVITIES DURING FISCAL YEAR

A. Planning and direction

Grasshopper control planning was jointly performed by personnel of the State Department of Agriculture, State Extension Service, and the Plant Pest Control Division, in cooperation with counties, landowners, and land operators concerned. The execution of plans agreed upon was under the direct supervision of Division and State personnel.

B. Technical assistance

Technical assistance to farmers and ranchers was provided by Division personnel and cooperating State and county officials. County agents and Extension Entomologists kept landowners and land operators fully advised regarding grasshopper development. Division and State officials provided assistance relative to the technical aspects of control.

C. Survey

Cooperative adult surveys were conducted throughout all areas of the Region during late summer of 1958. In areas found to be moderately or heavily infested, limited egg surveys were made in late fall after egg deposition was complete. Nymphal surveys were then made by Plant Pest Control field personnel the following spring. Organized and voluntary control action which followed was based upon the results of the nymphal surveys.

Damage to crop and range was restricted to small isolated areas in most States of the Region. Generally speaking, this pest was not of economic importance in Ohio, Kentucky, Michigan, and of only limited importance in isolated spots of Illinois, Indiana, Missouri, and Iowa. Minnesota and Wisconsin reported some damage in restricted locations. In Kansas, Nebraska, and North and South Dakota the problem was rather general, with considerable damage occurring in rather large areas. North and South Dakota, for example, report that savings due to control were $3,092,500 and $1,260,600, and the losses $798,500 and $2,957,700.

D. Eradication or control

Cooperative control was accomplished in Kansas and Nebraska by commercial aircraft, and in South Dakota by power wagon spray

units. In all cases, actual control began after the grasshopper hatch was complete and was finished before the nymphs became adults and started to lay eggs. Two ounces of actual aldrin, with sufficient fuel oil to make a gallon of solution, were applied at the rate of one gallon per acre where aircraft were used. Aldrin in emulsifiable form at the rate of from 2 to 5 gallons of aldrin-water per acre was applied by power wagon sprayer. The rate of toxicant per acre, however, was only 2 ounces.

The acres, by States, treated under the cooperatively-financed program include:

Kansas - 87,863. Work begun July 9 was completed July 26, at a total cost of $46,002, or 0.523 per acre.

Nebraska - 41,369, at an over-all cost of $22,007, or 0.532 per acre. Actual control started July 12 and was completed July 25.

South Dakota - 4,850 acres, costing $2,639, or 0.544 per acre; control dates, July 7 to August 15, 1958.

Grasshopper damage to cultivated crops throughout the Region was kept at a minimum due to the timely control action of farmers. Farmers consider the control of grasshoppers in their cultivated farmlands a regular farming practice.

Voluntary control was by both aircraft and ground equipment. The insecticides used included aldrin, heptachlor, and toxaphene.

E. Regulatory

All grasshopper control is performed on a voluntary basis. No regulatory action is involved.

F. Methods improvement

Improved procedures for testing insecticides, both in concentrated and finished solution, gave prompt assurance of standard-strength materials. Increased use of two-way radios and improved flagging or signalling methods where aircraft were used proved to be good insurance against "misses" and "skips" by the aircraft.

G. Other

Cooperation received during fiscal year

In Kansas, non-Federal funds paid two-thirds of the total cost of treating private and State lands, and the Division paid the remaining one-third. The L.U. lands included in the Kansas program were done at full Federal expense. All land sprayed in Nebraska was privately and State owned. Landowners paid one-third of the cost, the State of Nebraska one-third, and the Division one-third. NRBO issued the Invitation, Bid, and Award for each job.

Only Forest Service land was involved in the Black Hills area of South Dakota. The Forest Service personnel assisted in delimiting the areas to be treated. The Division furnished the insecticide and applied the spray material by Government-owned power wagon spray units. All cropland treated in the Region was done at full expense to the landowners and/or operators.

Appropriate State, Extension, Experiment Station, and agriculture workers assisted Plant Pest Control personnel with certain phases of all grasshopper survey and control activities.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

The established policy of conducting cooperative adult-, egg-, and nymphal surveys should be continued.

B. Eradication or control

Present procedures considered adequate.

C. Regulatory

Not applicable.

D. Methods improvement

Plant Pest Control and cooperating State officials should continue to be ever alert to ways of improving survey techniques and control procedures. The close cooperation which has existed between Methods Improvement Operations, the Regional office, and field stations should be continued.

E. Associated activities

All aspects of public relations affecting grasshopper work must be kept alive and current. A well-informed public always proves a vital part of all grasshopper control activities.

Each year the Division prepares and distributes two maps--i.e., (1) "Rangeland Grasshopper Control, Location and Size of Areas Cooperatively Treated, May-September 19__," and (2) "Grasshopper Adult Survey - Fall 19__."

Total Acres of Rangeland Treated Under Cooperatively Conducted Program for Grasshopper Control
Fiscal Year 1959

State	Private and State Land (Acres)	Federal Land (Acres)	Total Acres
Kansas	8,307	79,556	87,863
Nebraska	41,369	0	41,369
South Dakota	0	7,850	7,850
Totals	49,676	87,406	137,082

Cooperative Rangeland Grasshopper Control - Federal Land Ownership - Fiscal Year 1959

State	Area	Period of Control Operations	Land Ownership Total Acres - USDA
Kansas	Morton County	7/9 - 26/58	79,556
South Dakota	Black Hills Area	7/9 - 8/15/58	4,850*
Total Acres			84,406

*In addition, 3,000 acres in this area were treated in June 1959.

Cooperative Rangeland Grasshopper Control Operations
Acres Sprayed and Costs - Fiscal Year 1959

State and Location	Period of Control Operations	Acres Sprayed		Total Acres Treated	Costs				
		Contract Aircraft	Ground Equipment		States Counties Landowners	Other Coop. Federal Agencies	PPCD	Total	Av. per Acre
Kansas									
Morton County	7/9-26/58	87,863	0	87,863	$ 2,768.00	0	$43,234.00	$46,002.00	0.523
Nebraska									
Deuel-Cheyenne Counties	7/12-25/58	41,369	0	41,369	14,645.00	0	7,362.00	22,007.00	0.532
South Dakota									
Black Hills	7/9-8/15/58	0	4,850*	4,850*	0	250.00	2,389.00	2,639.00	0.544
Totals		129,232	4,850	134,082	$17,413.00	$250.00	$52,985.00	$70,648.00	

*In addition, 3,000 acres in the Black Hills National Forest were ground-treated in June 1959.

Summary of Associated Activities, Grasshopper Control - Fiscal Year 1959

State	Public Meetings Attended	Presentations: Talks	Slides	Films	Radio	TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins*	Circulars	Infest. Maps & Posters	Other
FEDERAL												
Kansas	0	0	0	0	0	0	0	0	0	0	210	0
Michigan	0	0	0	5	0	0	0	0	0	0	0	0
Minnesota	0	0	15	0	0	0	0	1	100	0	450	0
Nebraska	14	14	0	6	0	0	4	13	0	0	254	0
N. Dakota	4	0	0	0	0	0	0	1	100	0	50	0
S. Dakota	9	6	4	2	4	0	20	5	400	0	100	0
Wisconsin	0	0	0	0	0	0	0	0	25	0	15	0
Subtotals	27	20	19	13	4	0	24	20	625	0	1,079	0
COOPERATORS												
Minnesota	0	0	0	20	0	0	0	0	0	0	0	0
Missouri	6	6	6	0	0	0	0	0	0	0	0	0
Nebraska	5	5	0	0	0	0	0	0	0	0	0	0
N. Dakota	15	15	2	2	25	8	40	0	1,500	0	500	0
S. Dakota	20	20	3	1	25	3	40	1	2,000	0	1,500	0
Wisconsin	0	0	0	0	0	0	4	0	0	0	0	0
Subtotals	46	46	11	23	50	11	84	1	3,500	0	2,000	0
GRAND TOTALS	73	66	30	36	54	11	108	21	4,125	0	3,079	0

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.

Grasshopper Control Expenditure by Source and by Activity - Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
Plant Pest Control Division	$17,900	$18,800	$32,200	$84,600	0	$900	$1,300	$155,700
Other Organizations:								
Illinois	0	0	1,100***	0	0	0	0	1,100
Indiana	0	0	200***	0	0	0	0	200
Kansas	0	0	0	2,800	0	0	0	2,800
Minnesota	0	0	400	0	0	0	0	400
Missouri	0	0	1,700	0	0	0	0	1,700
Nebraska	0	0	0	15,300	0	0	0	15,300
North Dakota	0	0	0	13,100	0	0	0	13,100
Wisconsin	0	0	1,000	0	0	0	0	1,000
Subtotals	0	0	$ 4,400	$31,200	0	0	0	$ 35,600
CONTRIBUTED SERVICES**								
Kansas	0	1,000	0	400	0	0	0	1,400
Michigan	0	0	300	0	0	0	0	300
Minnesota	2,000	15,500	2,500	1,800	0	500	0	22,300
Missouri	300	7,000	0	0	0	0	0	7,300
Nebraska	0	1,600	0	0	0	0	0	1,600
North Dakota	7,500	7,000	3,500	0	0	0	0	18,000
Ohio	0	0	300	0	0	0	0	300
South Dakota	2,000	2,500	1,500	0	0	500	0	6,500
Wisconsin	300	1,100	0	500	0	100	0	2,000
Subtotals	$12,100	$35,700	$ 8,100	$ 2,700	0	$1,100	0	$ 59,700
GRAND TOTALS	$30,000	$54,500	$44,700	$118,500	0	$2,000	$1,300	$251,000

*Direct approp., allotments other sources, services & supplies for which there is a definite replacement value.
**Services incidental to other activities, for which only an estimated value is available.
***Includes chinch-bug survey: Ill. - $184; Ind. - $6.

Grasshopper Control - Cooperative Aid Received - Fiscal Year 1959

State	Cash or Equivalent Aid*				Total of Cash & Equiv.*	Intangible: Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 900	$ 0	$200	0	$1,100	$ 0	$ 1,100
Indiana	100	0	100	0	200	0	200
Kansas	2,800	0	0	0	2,800	1,400	4,200
Michigan	0	0	0	0	0	300	300
Minnesota	400	0	0	0	400	22,300	22,700
Missouri	0	1,400	300	0	1,700	7,300	9,000
Nebraska	15,300	0	0	0	15,300	1,600	16,900
North Dakota	13,100	0	0	0	13,100	18,000	31,100
Ohio	0	0	0	0	0	300	300
South Dakota	0	0	0	0	0	6,500	6,500
Wisconsin	0	1,000	0	0	1,000	2,000	3,000
Totals	$32,600	$2,400	$600	0	$35,600	$59,700	$95,300

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During the fall of 1958, Oklahoma farmers and ranchers, on a voluntary control basis, continued spray applications and the use of poison bait for grasshopper control for the protection of young sorghum plantings and fall-seeded wheat.

Grasshopper adult surveys conducted in the fall of 1958 showed infestation of approximately 2,693,182 acres of rangeland and a similar number of cropland field margins in Oklahoma, and in Texas only 1,215,000 acres were estimated to be in the 'threatening' or 'heavier' class. Egg surveys indicated very light infestations. The spring nymphal survey, however, disclosed only an estimated 130,000 acres of lightly infested rangeland in Oklahoma, and 11,861,000 infested acres in the Panhandle area of Texas with spotted acreage of 'severe' to "very severe" in only three or four counties. Surveys in Arkansas were negative.

B. Major deviation from Work Plan, if any

Due to the lightness of infestation, all control work was carried out on a voluntary basis.

C. Status of Program at close of year

Infestations were generally 'light' to "non-economic," but there were some local areas of severe infestations, so there was no interest in a general control program. A few farmers and ranchers applied insecticides for grasshopper control in conjunction with application of other chemicals for weed killing and control of other crop pests.

II. Program activities during fiscal year

A. Planning and direction

1. How planned and directed

This phase of the program is carried on in cooperation with the State and Federal Departments of Agriculture, Extension Service, County Committees, and property owners and operators. A definite program of responsibilities was planned early in the season with cooperators sharing in the plan.

B. Technical assistance

1. Technical assistance provided to farmers and others

Educational meetings, demonstrations, newspaper articles and program aids provided the means of informing farmers and ranchers of the nature and scope of the problems, the development of infestations, and recommended control practices. In voluntary control work, farmers and ranchers were advised of the timing of applications, kinds of insecticides, dosages required, and type of equipment needed.

2. Technical assistance by cooperating agencies

Assistance was provided by county agents in arranging and conducting educational and organizational meetings, surveys, species identification, supervisory assistance on control operations, and assistance in the technical phases of control measures.

C. Survey

1. Procedures or techniques used

a. Field

Grasshopper adult, egg, and pre-control nymphal surveys were made on range and croplands by cooperating state and federal personnel to determine in advance the general infestation picture and provide a basis for the planning of control measures. The adult survey is rather extensive and gives an indication of the extent of the infestation to be expected next season. The egg survey is to determine whether the infestation will be the same, greater, or less than that shown by the adult survey, and whether migration of adults had changed the indicated infestation picture. The nymphal survey is made in the spring after grasshoppers hatch to determine the degree of survival of the young grasshoppers.

b. Laboratory

Not applicable.

2. Accomplishments

Adult surveys were conducted in 16 counties in Arkansas, 43 counties of Oklahoma, and 97 counties of Texas during the fall of 1958. These surveys indicated that 2,693,182 acres of rangeland and a similar number of cropland acres were infested in Oklahoma and 9,689,000 acres were estimated as infested in Texas. The egg survey confirmed the earlier adult survey estimate as to the degree of infestation. Nymphal surveys, however, revealed only light populations except on

untreated land in Texas where populations ranged from non-economic to severe. The infested acreage estimates at the end of the year were: Arkansas, none; Oklahoma, 130,000; and Texas, 11,861,000.

3. State or table of pest damage

Grasshopper damage was confined to fall-seeded wheat fields.

D. Eradication or Control

1. Procedures or techniques used

Control of grasshoppers on cropland areas was voluntary on the part of each individual farmer. Cooperating state and federal personnel assisted in organizing community-wide control measures and provided survey information and technical advice to farmers.

2. Accomplishments

Farmers, on a voluntary basis, treated approximately 66,000 acres of cropland and adjacent field margins in Oklahoma and approximately 159,000 acres were treated in the Panhandle, north central, and east Texas areas.

E. Regulatory

Not applicable

F. Methods Improvement

Not applicable

G. Other

1. Cooperation received during fiscal year

a. Major contributions received and importance to program (other than funds)

The Agricultural Extension Service rendered valuable assistance in stimulating control efforts and provided methods of informing farmers and ranchers as to the nature and scope of the problem, the development of infestations, and the recommended control practices. Other cooperating state agencies assisted in the planning and operation of surveys during the year, in conjunction with other program activities.

b. Cooperative work needing strengthening another year

Farmer interest and participation in community-wide voluntary grasshopper control should be encouraged in the critical areas of Oklahoma and Texas.

2. Associated activities and services

Information was furnished the Grasshopper Research Station at Bozeman, Montana, and the chemical industry at various times during the season. Farmers and ranchers were informed by use of newspapers, radio, meetings and other media of the progress and final results of the surveys.

III. Recommendations for coming year

A. Survey

Special attention should be given to adult and nymphal surveys , and observations should be made to detect any unusual conditions of migration.

B. Eradication or control

Additional emphasis should be placed on the voluntary community-wide control efforts, in order to hold infestations to present level, rather than letting them build up to include wider areas.

C. Regulatory

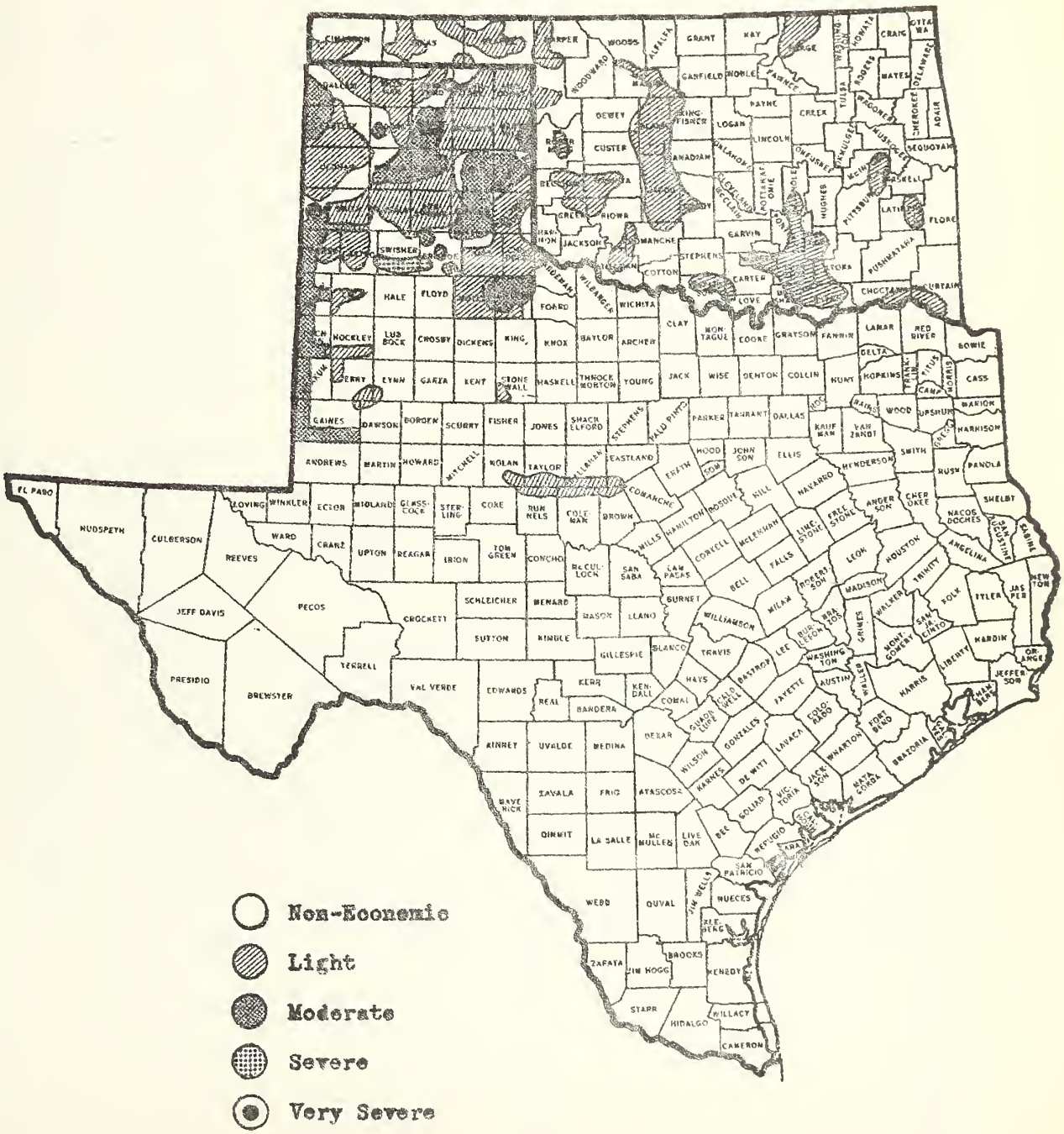
Not applicatle

D. Methods Improvement

It is recommended that further study be made on methods for quick analysis of insecticides during a control program to prevent delay in operation and still insure that materials purchased meet all specifications.

It is also recommended that when further infestations develop, warranting cooperatively financed control, efforts should be concentrated on developing an agreement which sets forth in detail required stipulations rather than using the agreements formulated in past programs.

GRASSHOPPER OUTLOOK - SPRING OF 1959



GRASSHOPPER

Region	Prepared by
Southern	

Period *(Designate: Month, 1-15, 16-31, or 1-31)*	Date prepared
Fiscal Year 1959	

COUNTY OR LOCATION A	STATUS First of Period B	INFESTED ACRES* State & Private C	INFESTED ACRES* Public Domain** D	INFESTED ACRES* Total Acreage E	ACRES SCHEDULED FOR TREATMENT F	ACREAGE TREATED State & Private G	ACREAGE TREATED Public Domain** H	ACREAGE TREATED Total Acres I	STATUS End of Period J
Oklahoma	130,000	130,000	0	130,000					130,000
Texas	11,861,000	11,801,000	60,000	11,861,000					11,861,000
Voluntary treatments:									
Oklahoma 66,000 Acres									
Texas 159,000 Acres									
Total This Period	11,991,000	11,931,000	60,000	11,991,000	0	0	0	0	11,991,000
Total From July 1						0	0	0	

*Any minus figure must be explained.

**Identify ownership by Agency, i.e., BLM, Forest Service, etc.

PPC 7-6
(Feb.-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Grasshopper — SUMMARY OF ASSOCIATED ACTIVITIES — Prepared by: _____

Region Southern — Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
Oklahoma	The farmers and ranchers as well as the chemical industry were kept fully informed on infestation developments as indicated by the surveys. All methods of disseminating information, as above listed, were used, but no record kept as to number of each.											
Texas	500 (est.) meetings were with County Agents, Aerial Applicators, County Grasshopper Committees, and interested farmers and ranchers.											
Total												

GRASSHOPPER CONTROL

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

* *

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER CONTROL

July 1, 1958 - June 30, 1959

In cooperation with
County, State, and Federal Agencies,
and with Organized Rancher Groups

December, 1959
Oakland, California

Jim R. Dutton
Regional Supervisor

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

Cooperative grasshopper control on rangelands in the Western Region was necessary on a lesser acreage than for several past years. Cooperative programs were in effect in the States of Idaho, Montana, Nevada, New Mexico, and Wyoming. Voluntary programs, where the Division provided technical information available from surveys, plus control recommendations, accounted for control on acreage nearly equal to that treated in the cooperative programs. California and Colorado contributed the major accomplishments in this type of control. Nearly five-sixths of the acreage treated in Montana was in cooperation with Entomology Research Division.

On a limited acreage, it was necessary to treat several Nevada areas reseeded by agencies of the U. S. Department of Interior. Camnula pellucida is a particularly troublesome species in these newly re-grassed areas.

Total cooperative rangeland accomplishments for the fiscal year are shown in the table entitled "Cooperative Range Grasshopper Control Operations, Acreages Sprayed and Costs."

Major Deviation from Work Plan

Reduction in over-all acreage planned for treatment was greatest in California and Colorado, where indicated high populations did not materialize. The type of weather experienced during the spring of 1959 was such that grasshopper development in the plains areas of eastern Colorado was greatly impeded. Parasite and predator damage to eggs was very heavy. Severe snowstorms occurred into late May, and cold, wet soil conditions persisted throughout the spring. While control work was planned for on $1\frac{1}{2}$ million acres, none was necessary. On the Manti-La Sal National Forest in Utah, grasshopper eggs did not hatch, although they remained viable; therefore, control work planned for the 1958 season was delayed until mid-July of the 1959 season. This 2-year cycle, or alternating type generation, has been recognized as characteristic of several species in many areas during the past several years.

Lack of rancher cooperation resulted in much reduced programs in Montana, New Mexico, and Wyoming, and there were also very marked reductions in infestations in Montana.

Status of Program at Close of Fiscal Year

Due to effective work done in the summer of 1958 and to biological factors, on June 30, 1959, less than a million acres of rangeland were known to carry infestations of grasshoppers in numbers sufficient to require control. Montana, New Mexico, Utah, and Wyoming had significant areas of infestation at that time. It is interesting to note that the fungus, Entomophthora grylli, was credited with a large assist in bringing California infestations to a non-economic status at year's end.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

Generally, programs were jointly planned and directed by Plant Pest Control and State personnel. In some states rancher committees or grasshopper control boards participated in planning. Where lands of other Federal agencies were concerned, the managing agency frequently assisted in this phase of the operation. Close contact was maintained with Entomology Research Division in executing all programs.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Landowners and managers were informed of expected control needs and problems by Plant Pest Control personnel, either through personal contacts or reports to cooperating state and county employees. Property owners were advised of approved insecticide treatments and the timing of application. In some states, county and state personnel unfamiliar with approved procedures were instructed in all phases of grasshopper control, including surveys, organization, and insecticide application. Control demonstrations were another means utilized in assisting cooperators.

Technical assistance provided to program by cooperating agencies

Personnel of Entomology Research Division stationed in the field provided timely information relative to the program. They advised with regard to insecticides, residues, and biological problems. The laboratories in Bozeman, Montana,

and Tempe, Arizona, were particularly helpful. Experiment Station personnel in several states shared their research findings with us and advised field supervisors with regard to local problems.

Survey

Procedures or techniques used

Grasshopper surveys are standardized, and there were no known divergences from the standards.

Accomplishments

Precontrol nymphal surveys were made in all areas where cooperative control programs were anticipated. In all other areas nymphal surveys were made as time and available personnel permitted. Adult surveys were made in all counties in the Region having records of grasshopper infestation problems. In some states every county was surveyed; in others only those thought to have economic or near economic infestations were included. Adult survey accomplishments are depicted in the table entitled "Work Report - 1958 Adult Grasshopper Survey." Limited egg surveys were made in crop areas of several states.

Statement or table of crop losses

(See table "Voluntary and Cooperatively Financed Grasshopper Control, Estimates of Acres Protected, Loss in Dollars, and Savings in Dollars, as Reported by States, 1958 Growing Season."

Eradication or Control

Procedures or techniques used

Generally speaking, control was obtained by means of aerial insecticide sprays. In Idaho, however, baits were used. Sprays were applied at the rate of one gallon of insecticide per acre. Each gallon of formulated spray contained two ounces of aldrin. Baits used consisted of large, flaky bran or steamed rolled wheat with two ounces of aldrin added to each 100 pounds of the bran or wheat. Seven pounds of bait per acre was applied by aircraft.

In addition to the aerial application of sprays, limited areas were treated with ground spraying equipment. Aldrin was used in ground equipment also and was applied at the rate of two ounces per acre. Water was the usual diluent

and the amount of finished material applied varied from two to five gallons per acre, depending upon the type of equipment used.

Entomology Research used several different insecticides at varied application rates on a trial basis in Montana.

Voluntary control work on rangeland was accomplished by airplane or ground rig spray application of aldrin, dieldrin, or heptachlor. Voluntary cropland control was similarly accomplished, although different insecticides may have been utilized. Instead of sprays, baits were used in some instances. Statistics recording this work appear in the table "Voluntary Control - Estimated Acreages of Land Treated and Insecticides Used as Reported by States - 1958 Growing Season."

Accomplishments

All types of control accomplishments are shown in table form and on the control map in this report. The accomplishments for the fiscal year are those financed from 1959 fiscal year funds.

Regulatory

Does not apply

Methods Improvement

Several new or alternate insecticides were tested on 640-acre plots by Entomology Research, assisted by Plant Pest Control personnel. These insecticides were first screened on 40-acre test plots. So far, no material that has been tested and reported on to us is superior to certain of the chlorinated hydrocarbons, especially when cost of materials, safety in use, and other such related factors are considered.

Two-way radios were again used to excellent advantage. Sensitized cards were widely used in checking the patterns of aerial application of oil sprays.

Other

Cooperation received during fiscal year

The Wyoming Department of Agriculture again contracted for insecticide and aerial application in Wyoming. Agricultural Research Service did the contracting elsewhere. Seasonal personnel in Wyoming were principally provided by the same

State agency, and the Division furnished their transportation. The Bureau of Indian Affairs cooperated generously in Wyoming and to a limited extent in Montana.

The U. S. Forest Service helped wherever possible when infestations were treated on lands managed by it. State Departments of Agriculture, Experiment Stations, and Extension Services, with few exceptions, assisted with control work in many ways. Rancher committees helped in several states. In New Mexico such committees did much of the scouting and mapping of grasshopper infestations. Established patterns of financial responsibility were adhered to.

Associated activities and services

Many of these activities are shown in an accompanying table. Another such activity in California involved the training of county personnel in grasshopper control work. Federal supervisors worked with individuals and groups to provide a nucleus of trained persons in each county.

RECOMMENDATIONS FOR COMING YEAR

Survey

Nymphal and adult surveys should be continued. Egg surveys should be used at times in cropped areas and, under certain infestation circumstances, in rangelands. We have in mind, here, locating the egg-laying areas utilized by the migratory grasshopper Dissosteira longipennis, in particular. The most reliable surveys are made by experienced personnel, and it is suggested that we program to employ and train seasonal personnel that can be counted on to return to our work year after year. High school science teachers and qualified students are representative of the type of persons desired.

More time and effort should be devoted to surveys in croplands so that additional assistance can be given farmers in planning their control of grasshoppers.

Grasshoppers infesting some range areas have an alternating type of development or a 2-year cycle, appearing only every other year. It is suggested that careful egg surveys in such areas may help us to plan more adequate control programs there. Predation, parasitism, and other factors affecting the carry-over egg pods may substantially influence planning.

Control

For the first time in twenty years, significant damage to fall planted wheat in Utah has been done by grasshoppers. Damage has been noted only in those areas where Soil Bank or Conservation Reserve lands are comparatively extensive and serve as undisturbed grasshopper breeding areas. Similar conditions occur in other states, and they constitute a serious problem in the protection of crops and any associated rangelands.

We should continue to study this problem and to assist landowners in abating this threat.

The survey recommendation with regard to trained personnel is equally applicable in control.

Regulatory

Does not apply

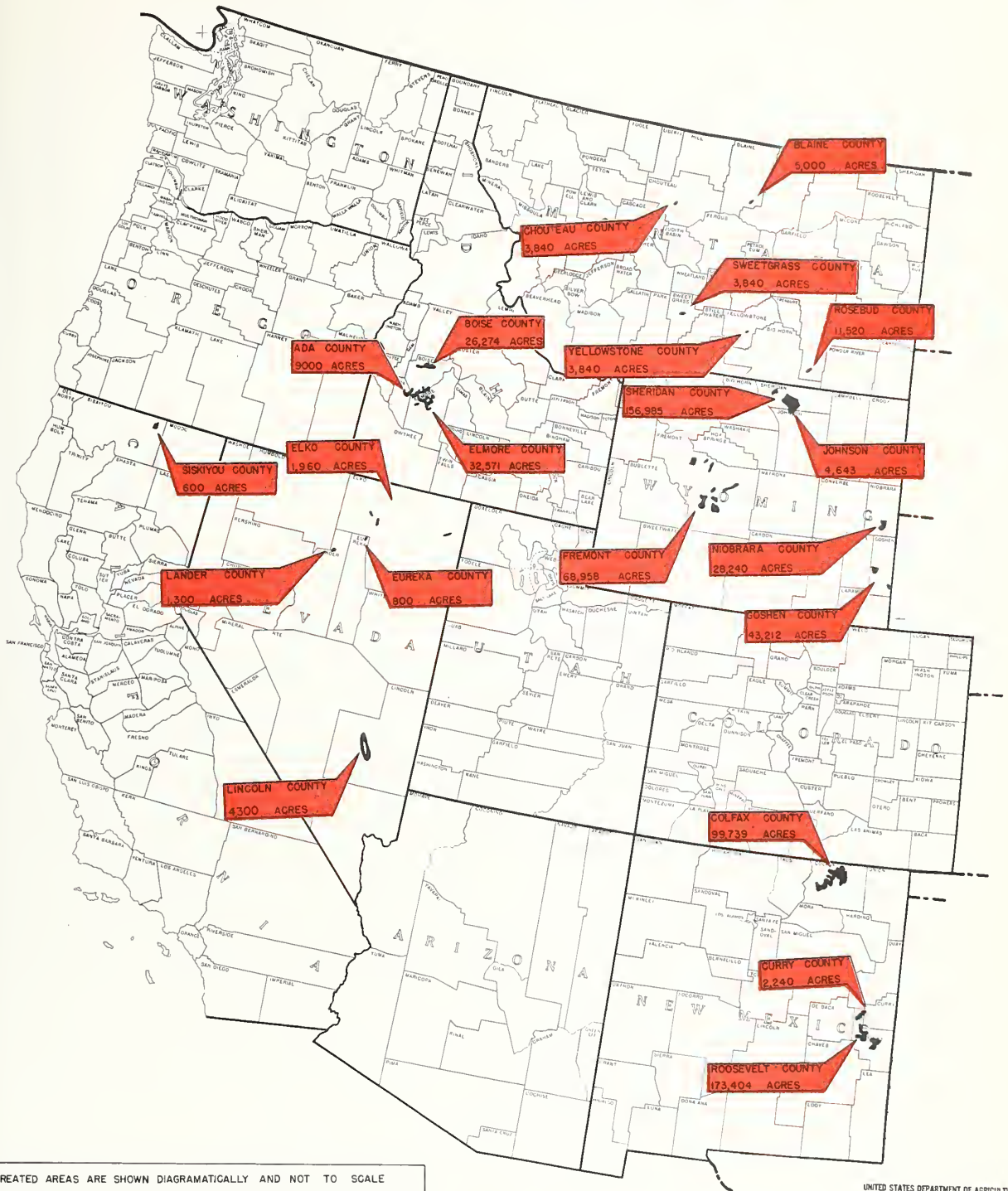
Methods Improvement

It is suggested that research be encouraged to improve survey methods and evaluation and to continue the search for more effective and safer means of control. The real dangers of insecticide residue to man and other animals should be studied. In this connection it would be well to obtain more information relative to intervals between application of insecticides and use of treated forage or food crops. We should continue to cooperate with those agencies participating in Project W-37 on grasshoppers and related insects. It is suggested that we should learn whether modifying droplet size of insecticide through use of higher viscosity oils would permit spraying during periods of higher temperatures, under more severe wind conditions, and at greater flight elevations.

Efforts should be continued to keep landowners informed with regard to the importance of recognizing the dangers involved in permitting grasshoppers to increase to outbreak proportions.

GRASSHOPPER CONTROL —— RANGELAND

LOCATION OF AREAS COOPERATIVELY TREATED FISCAL YEAR 1959



TREATED AREAS ARE SHOWN DIAGRAMATICALLY AND NOT TO SCALE BECAUSE OF SMALL NUMBER OF ACRES INVOLVED IN SOME COUNTIES. ACTUAL TREATED ACREAGES ARE SHOWN ON LEGENDS.

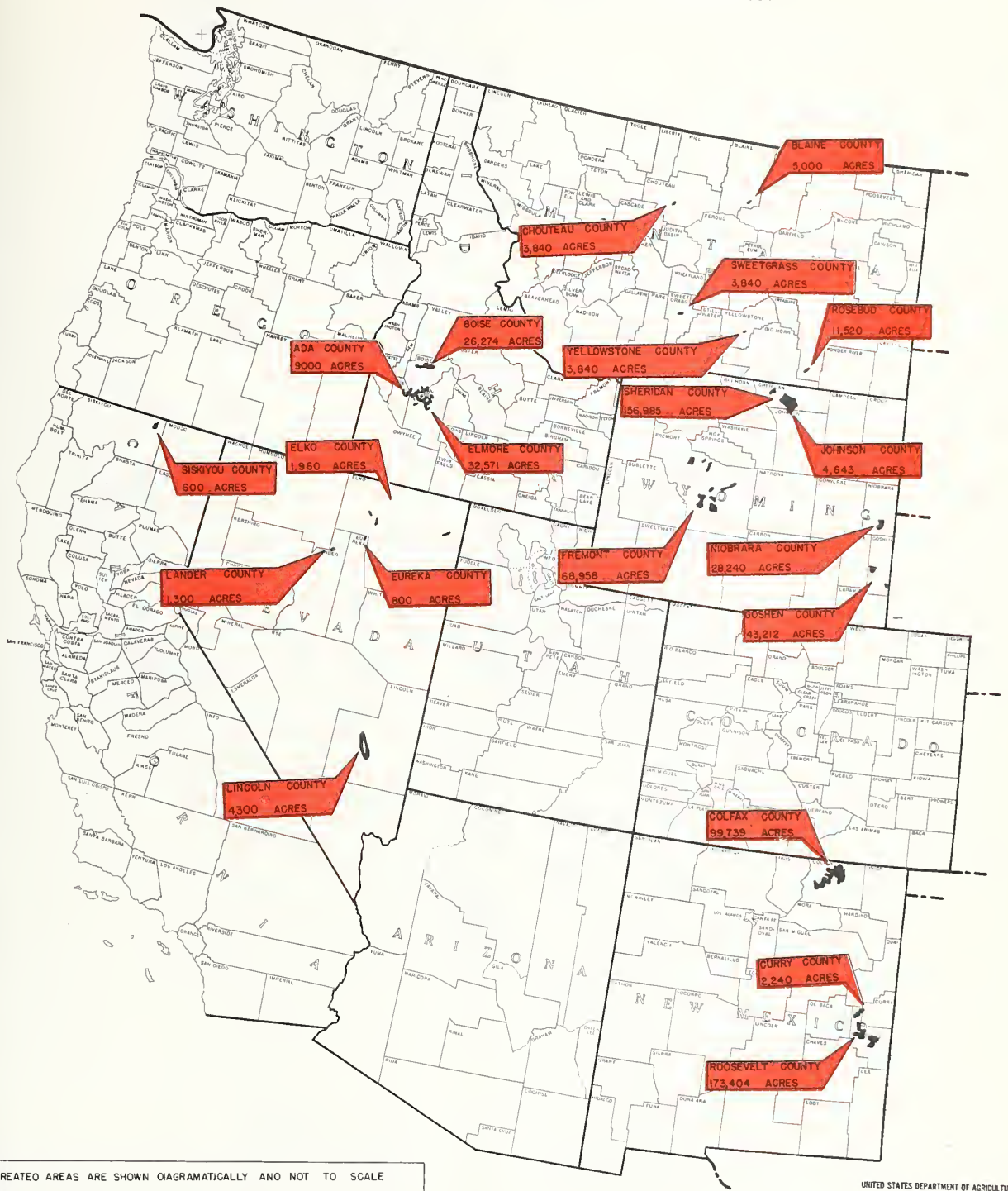
TOTAL ACRES TREATED 682,266

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 1959

GPO 978991

GRASSHOPPER CONTROL —— RANGELAND

LOCATION OF AREAS COOPERATIVELY TREATED FISCAL YEAR 1959



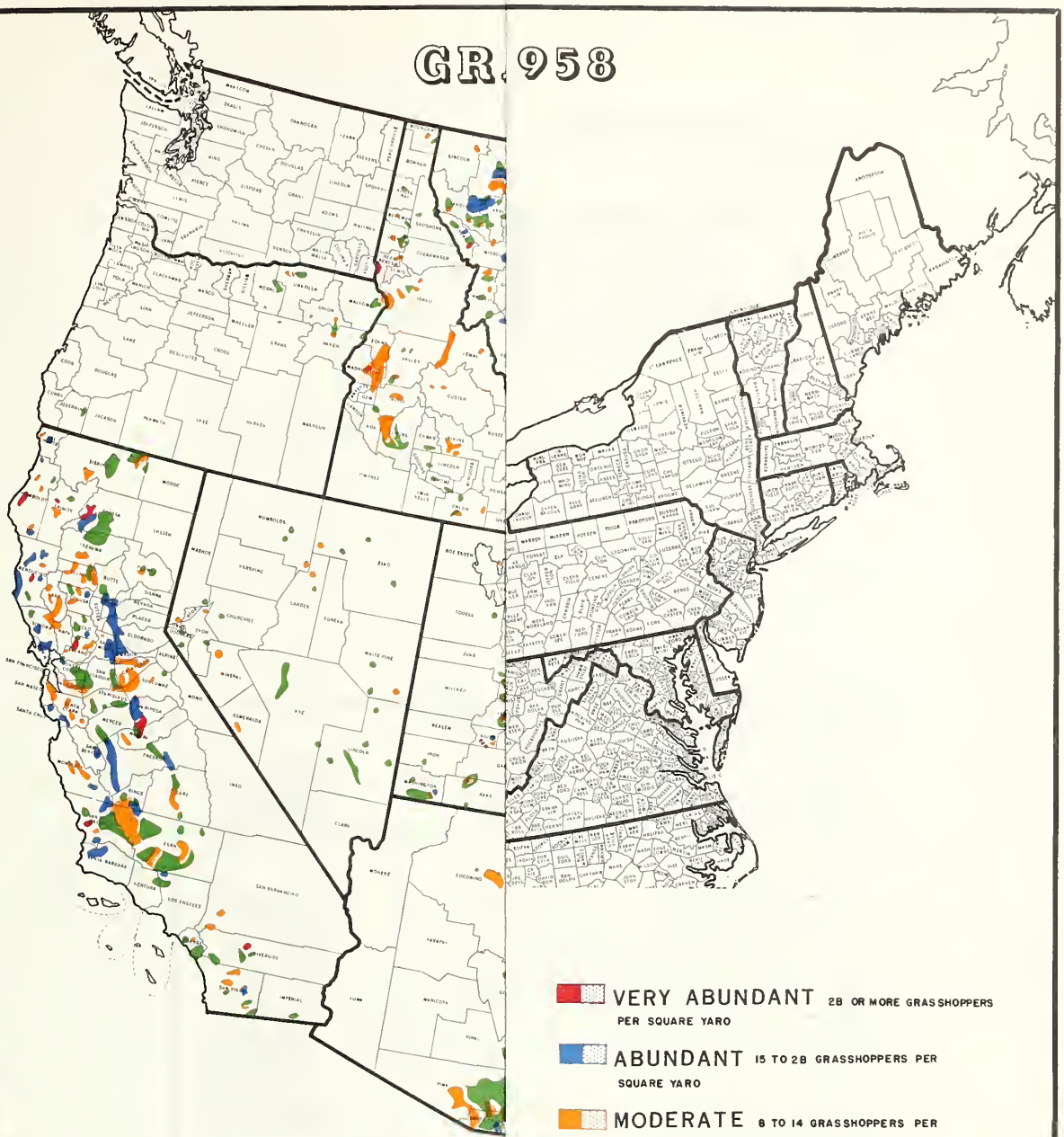
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TOTAL ACRES TREATED 682,266

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 1959

GPO 978991

GR. 958



VERY ABUNDANT 28 OR MORE GRASSHOPPERS PER SQUARE YARO

ABUNDANT 15 TO 28 GRASSHOPPERS PER SQUARE YARO

MODERATE 8 TO 14 GRASSHOPPERS PER SQUARE YARO

LIGHT 3 TO 7 GRASSHOPPERS PER SQUARE YARO

SOLIO COLORS - RANGELANO INFESTATIONS

STIPPLEO COLORS - CROPLANO INFESTATIONS

NECESSITY FOR CONTROL ON CROP OR RANGELANO WILL DEPENO UPON TYPE OF HABITAT, SPECIES PRESENT, WEATHER, ANO CONOITION OF VEGETATION.

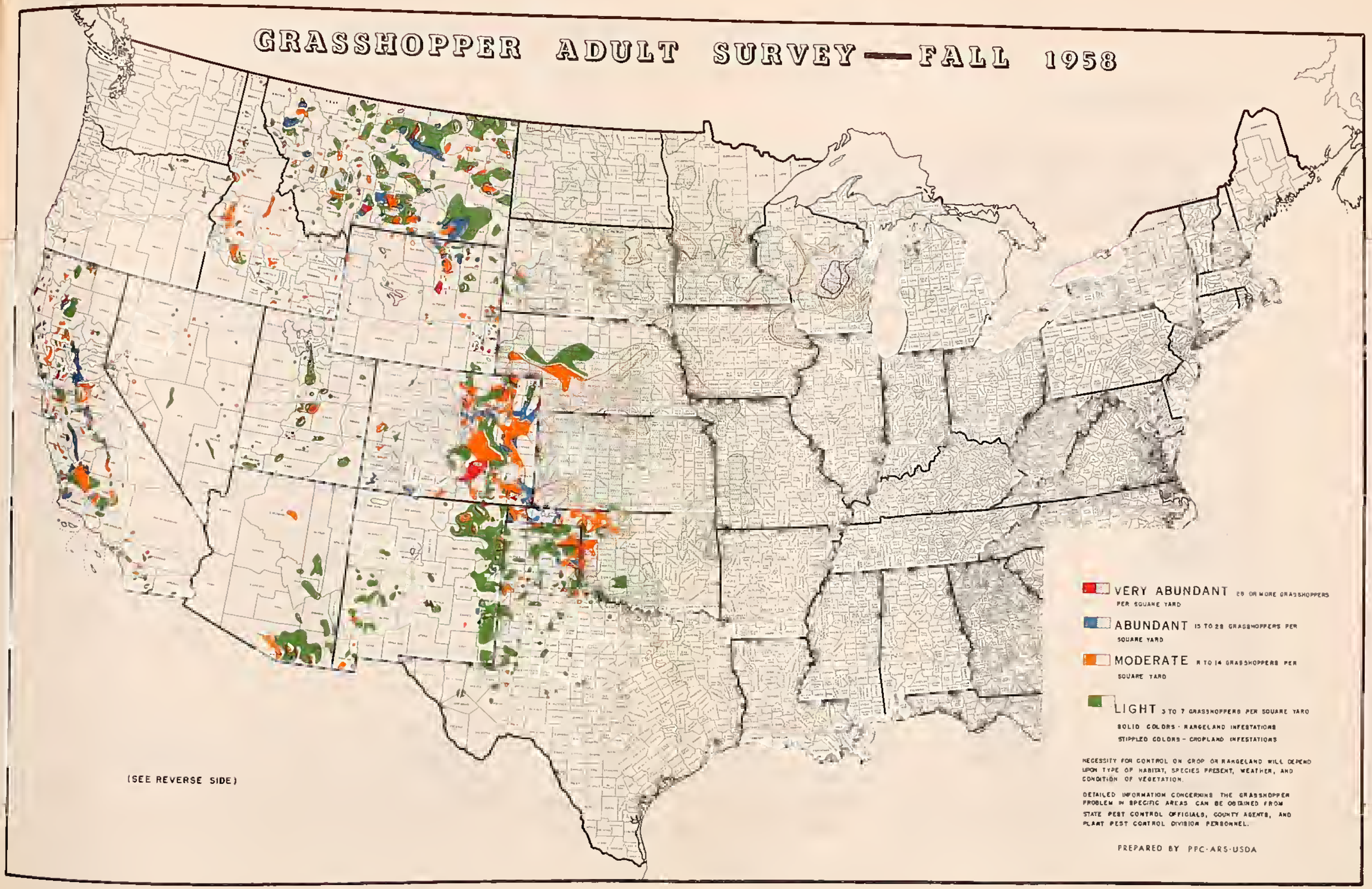
OETAILEO INFORMATION CONCERNINB THE GRASSHOPPER PROBLEM IN SPEGIFIC AREAS CAN BE OBTAINEO FROM STATE PEST CONTROL OFFICIALS, COUNTY AGENTS, ANO PLANT PEST CONTROL OIVISION PERSONNEL.

PREPARED BY PPC-ARS-USDA

(SEE REVERSE SIDE)

GPO 857791

GRASSHOPPER ADULT SURVEY — FALL 1958



VERY ABUNDANT 25 OR MORE GRASSHOPPERS PER SQUARE YARD

ABUNDANT 15 TO 25 GRASSHOPPERS PER SQUARE YARD

MODERATE 8 TO 14 GRASSHOPPERS PER SQUARE YARD

LIGHT 3 TO 7 GRASSHOPPERS PER SQUARE YARD

SOLID COLORS - RANGELAND INFESTATIONS

STIPPLED COLORS - CROPLAND INFESTATIONS

NECESSITY FOR CONTROL ON CROP OR RANGELAND WILL DEPEND UPON TYPE OF HABITAT, SPECIES PRESENT, WEATHER, AND CONDITION OF VEGETATION.

DETAILED INFORMATION CONCERNING THE GRASSHOPPER PROBLEM IN SPECIFIC AREAS CAN BE OBTAINED FROM STATE PEST CONTROL OFFICIALS, COUNTY AGENTS, AND PLANT PEST CONTROL DIVISION PERSONNEL.

PREPARED BY PPC-ARS-USDA

(SEE REVERSE SIDE)

GPO 857791

MENT OF AGRICULTURE
SEARCH SERVICE
TROL DIVISION

sshopper adult surveys made during the late summer
many grasshoppers infest an area, and indicate the
surveys, made each spring, provide the final index
l that growing season.

opling, in general are slightly higher than that which
be handled by the farmers with technical assistance
nge areas, shown on the map in solid colors, total
. Shaded areas are diagrammatic. Within these areas

NS --- ACREAGE BY REGIONS, FALL 1958

REGION AND STATE	LANDOWNERSHIP - ACRES		Total Acres
	Private & State	Public Domain	
Montana	1,285,000	1,140,000	2,425,000
Nevada	12,700	171,840	184,540
New Mexico	768,820	62,000	830,820
Oregon	10,000	--	10,000
Utah	9,000	61,500	70,500
Wyoming	799,000	156,000	955,000
SOUTHERN:			
Oklahoma	2,693,182	--	2,693,182
Texas	3,460,000	--	3,460,000

l Division, Agricultural Research Service in cooperation with
cies concerned.

20, 1958

Grasshopper Control

WORK REPORT
1958 ADULT GRASSHOPPER SURVEY

Fiscal Year 1959

State	No. of Counties Surveyed	Total No. of Stops	Miles Traveled on Survey	No. of Men		Man Days		Time Period		Cost	
				PPCD	State & Co.	PPCD	State & Co.	Start	Stop	PPCD	State & Co.
Arizona	7	205	5,583	4	0	34	0	8/11/58	8/27/58	$345	0
California	116	830	20,355			40	160	7/9/58	9/11/58	825	6,236
Colorado	41	332	10,113	14	11	46	2	7/22/58	8/8/58	668	*
Idaho	44	507	21,623	10	0	136	0	8/4/58	8/29/58	2,406	0
Montana	54	944	28,856	10	0	160	0	7/29/58	8/29/58	1,754	0
Nevada	16	110	9,870	3	2	49	30	8/1/58	8/31/58	1,477	990
New Mexico	33	506	18,086	5	0	90	0	7/29/58	9/18/58	1,505	0
Oregon	22	117	5,690	2	1	34	4	7/29/58	8/28/58	357	200
Utah	41	309	14,976	5	0	86	0	7/24/58	8/20/58	777	0
Washington	20	129	4,752	2	0	30	0	7/28/58	8/15/58	269	0
Wyoming	18	226	14,462	4	2	70	30	7/22/58	8/29/58	650	270
Total	412	4,215	154,366	59	16	775	226			$11,033	$7,696

*Not reported

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

TO COOPERATORS:

This map is based upon the results of cooperative grasshopper adult surveys made during the late summer and fall of 1958. The survey reveals where and how many grasshoppers infest an area, and indicate the potential severity of infestations for 1959. Nymphal surveys, made each spring, provide the final index of grasshopper populations which will warrant control that growing season.

The infestation on croplands, shown on the map in stippling, in general are slightly higher than that which was indicated for 1958. Control on those lands will be handled by the farmers with technical assistance from Division and State personnel. The infested range areas, shown on the map in solid colors, total 22,666,922 acres in 15 Western and Midwestern States. Shaded areas are diagrammatic. Within these areas infestations may be solid or spotted.

RANGELAND GRASSHOPPER INFESTATIONS --- ACREAGE BY REGIONS, FALL 1958

REGION AND STATE	LANDOWNERSHIP - ACRES		Total Acres	REGION AND STATE	LANDOWNERSHIP - ACRES		Total Acres
	Private & State	Public Domain			Private & State	Public Domain	
CENTRAL:				Montana	1,285,000	1,140,000	2,425,000
Kansas	365,000	--	365,000	Nevada	12,700	171,840	184,540
Nebraska	570,000	--	570,000	New Mexico	768,820	62,000	830,820
So. Dakota	--	6,000	6,000	Oregon	10,000	--	10,000
				Utah	9,000	61,500	70,500
WESTERN:				Wyoming	799,000	156,000	955,000
Arizona	252,080	70,000	322,080				
California	4,523,300	--	4,523,300	SOUTHERN:			
Colorado	5,619,000	68,000	5,687,000	Oklahoma	2,693,182	--	2,693,182
Idaho	284,740	279,760	564,500	Texas	3,460,000	--	3,460,000

The survey was planned and performed by the Plant Pest Control Division, Agricultural Research Service in cooperation with various State agencies concerned.

November 20, 1958

COOPERATIVE RANGELAND CONTROL ACCOMPLISHMENTS
DURING FISCAL YEAR 1959

Grasshopper Control

State	Private and State Lands (Acres)	Federal Lands (Acres)	Total Acreage
California		600	600
Idaho	11,774	56,071	67,845
Montana	7,680	20,360	28,040
Nevada	2,100	6,260	8,360
New Mexico	267,303	8,080	275,383
Wyoming	232,840	69,198	302,038
Totals	521,697	160,569	682,266

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF AGRICULTURE LANDS

Grasshopper Control

Fiscal Year 1959

STATE	AREA	Period of Control	Land Ownership (Acres) Forest Service
Idaho	S. Fork & Middle Fork Boise River (Ada, Elmore, Boise Co.) and S. Fork Payette River in Garden Valley - Lowman areas Boise Co.	6/30-7/25/59	52,071
New Mexico	Tolar Area (Roosevelt County)	6/16-26/59	400
Total			52,471

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF THE AIR FORCE

Grasshopper Control

Fiscal Year 1959

STATE	AREA	Period of Control	Land Ownership (Acres)
New Mexico	West Floyd (Roosevelt Co.) U.S. Air Force Bombing Range	6/18-29/59	7,680
Total			7,680

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF INTERIOR LANDS

Grasshopper Control

Fiscal Year 1959

STATE	AREA	Period of Control	Land Ownership (Acres)				Total Acres Treated
			Fish and Wildlife Service	Bur. Rec.	BLM	Indian Service	
California	Tulelake Nat'l Wildlife Refuge	7/23/58	600				600
Idaho	S. Fork & Middle Fork Boise R. (Ada, Elmore, Boise Co.) & S. Fork Payette River in Garden Valley-Lowman areas, Boise County	6/30-7/25/59			4,000		4,000
Montana	15 mi. E. Billings (Crow Ind. Res.)	7/27-31/58				3,840	3,840
	Lodgepole (Ft. Belknap Ind. Res.)	7/1-8/5/58				5,000	5,000
	Busby (N. Cheyenne Ind. Res.)	6/27-7/15/59				11,520	11,520
Nevada	Alamo (Pahranagat Valley) (Lincoln Co.)	7/1-8/5/58			3,100		3,100
	Tuscarora (Independence Valley) (Elko Co.)	7/1-8/5/58			500		500
	Stampede (Lone Mt.)(Elko Co.)	7/1-8/5/58			1,000		1,000
	Wilkins (Thousand Springs) (Elko Co.)	7/1-8/5/58			460		460
	Carlin (Maggie Cr.) (Eureka Co.)	7/1-8/5/58			800		800
	Battle Mt. (Martin Ranch Area) (Lander Co.)	7/1-8/5/58			400		400

(Continued)

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF INTERIOR LANDS
(Continued)

Grasshopper Control

Fiscal Year 1959

STATE	AREA	Period of Control	Land Ownership (Acres)				Total Acres Treated
			Fish and Wildlife Service	Bur. Rec.	BLM	Indian Service	
Wyoming	Ft. Laramie (Goshen Co.)	7/11-19/58		500			500
	Riverton (Fremont Co.)	7/12-18/58				8,736	8,736
	Ft. Washakie " "	7/12-18/58				23,676	23,676
	Shotgun Bench " "	7/12-18/58				9,726	9,726
	Dinwoody " "	7/12-18/58				1,200	1,200
	Black Mountain (Fremont Co.)	7/12-18/58				7,360	7,360
	Ethete " "	7/15-8/15/58				18,000	18,000
Total			600	500	10,260	89,058	100,418

JUNE STATISTICAL REPORT
GRASSHOPPER
Including Cumulative Control Data for Fiscal Year 1959

Region: Western | Prepared by: WPPCR
Period (Designate: Month, 1-15, 16-31, or 1-31): June 1 - 30, 1959 (Final Report) | Date prepared: 9/17/59

COUNTY OR LOCATION A	STATUS First of Period B	INFESTED ACRES* State & Private C	INFESTED ACRES* Public Domain** D	INFESTED ACRES* Total Acreage E	ACRES SCHEDULED FOR TREATMENT F	ACREAGE TREATED State & Private G	ACREAGE TREATED Public Domain** H	ACREAGE TREATED Total Acres I	STATUS End of Period J
Arizona	322,080	253,580	70,000	323,580	1,500	0	0	0	322,080[a]
California	4,523,300	4,523,300	0	4,523,300	0	0	0	0	4,523,300
Colorado	5,687,000	150,000	50,000	200,000	54,000	0	0	0	90,000[a]
Idaho	584,500	276,240[b]	251,831[b]	528,071	206,470	10,500	56,071	66,571	461,500
Montana	2,425,000	1,285,000	1,140,000	2,425,000	11,520	0	11,520	11,520	2,413,480
Nevada	183,240	11,900	171,340	183,240	0	0	0	0	183,240
New Mexico	830,820	937,624[b]	70,080	1,007,704	277,623	267,303	8,080	275,383	732,321
Oregon	10,000	0	0	0	0	0	0	0	-0-
Utah	70,500	0	60,500	60,500	60,500	0	0	0	60,500
Washington	0	0	0	0	0	0	0	0	0
Wyoming	955,000	281,170	45,320	326,490	209,320	0	3,248	3,248	323,242
Total This Period	15,591,440	7,718,814	1,859,071	9,577,885	820,933	277,803	78,919	356,722	9,109,663[d]
Total From July 1						521,697[c]	163,817[c]	685,514[c]	

(All work accomplished with FY 1959 funds)

a/ 1,500 acres voluntarily controlled in Arizona and 110,000 on rangeland in Colorado.

b/ Revised figures due to increase in scheduled acreage for treatment above amount infested in several counties.

c/ Montana reports breakdown change in 1958 carryover treatment of 3,840 acres from S&P to PD. Cumulative totals also include 1,200 in column G; 5,860 in column H; and 7,060 in column I for Nevada. These are carryover figures from 1958 control season which should have been included in the October 1958 cumulative columns.

d/ Difference of 111,500 acres due to voluntary work done in Arizona and Colorado not reflected in columns G, H, and I.

*Any minus figure must be explained.

**Identify ownership by Agency, i.e., BLM, Forest Service, etc.

SUMMARY OF ASSOCIATED ACTIVITIES

Grasshopper Control

Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Arizona	1	1									25	
California	12	12	12	5			57		3,500	5	250	3
Colorado	14	14	2	1			5				50	1
Idaho	18	1			1		2		5		60	
Montana	9	8										
Nevada	10	2					2		20	20	15	8
New Mexico	10	10		1					125		75	
Oregon									10		50	2
Utah	13	18	25	18	9	2	14		382	2,100	60	8
Washington									10		50	2
Wyoming	15	15									108	
Total	102	81	39	25	10	2	80		4,052	2,125	743	24

* Written by Federal personnel for release direct or through cooperators.

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS
ACREAGES SPRAYED AND COSTS

Grasshopper Control

Fiscal Year 1959

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties,& Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
California									
Tulelake Nat'l. Wildlife Ref.	7/23,58	600		600	$	$	$ 517	$ 517	$0.861
Total		600		600	$	$	$ 517	$ 517	$0.861
Idaho									
Boise Co.-S. Fork of Boise Elmore Co. - S. Fork Payette Ada-Elmore-Boise Cos. (S. Fork & Middle Fork Boise R. & Boise Co. S. Fork Payette R. in Garden Valley)	7/19-20,58	1,274		1,274	1,388		302	1,690	1.33
	6/30-7/25,59	66,571		66,571	13,450		27,624	41,074	0.62
Total		67,845		67,845	$14,838	$	$27,926	$42,764	$0.633

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Grasshopper Control

Fiscal Year 1959

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties,& Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Montana									
Ft. Belknap Res.(Blaine) Coop. ENT	7/1-8/5,58		5,000	5,000	$	$	$ 3,000	$3,000	$0.60
Shonkin (Chouteau)	7/16-20,58	3,840		3,840			3,520	3,520	0.91
Bigtimber (Sweetgrass)	7/21-25,58	3,840		3,840			3,520	3,520	0.91
Billings (Yellowstone)	7/27-31,58	3,840		3,840			3,520	3,520	0.91
N.Cheyenne Res. (Rosebud)	6/27-7/15,59	11,520		11,520			13,748	13,748	1.193
Total		23,040	5,000	28,040	$	$	$27,308	$27,308	$ 0.974
Nevada									
Lander Co.	7/1-8/5,58		1,300	1,300	590		1,052	1,642	1.267
Elko Co.	7/1-8/5,58		1,960	1,960	895		1,595	2,490	1.267
Eureka Co.	7/1-8/5,58		800	800	365		650	1,015	1.267
Lincoln Co.	7/1-8/5,58		4,300	4,300	1,957		3,488	5,445	1.267
Total			8,360	8,360	$3,807	$	$6,785	$10,592	$1.267

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Grasshopper Control

Fiscal Year 1959

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties, & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
New Mexico									
Tolar Area (Curry-Roosevelt)	6/16-26,59	38,225		38,225	$12,240	$	$ 6,314	$18,554	$0.4854
Delphos (Roosevelt)	6/9-20,59	53,846		53,846	16,120		7,974	24,094	0.4475
West Floyd (Roosevelt)	6/18-29,59	83,573		83,573	21,460		13,986	35,446	0.4241
Raton(Colfax)	6/29-7/14,59	99,739		99,739	29,186		14,595	43,781	0.43892
Total		275,383		275,383	$79,006	$	$42,869	$121,875	$0.4425
Wyoming									
Roadsides (Goshen)	7/1-3,58		600	600	70		35	105	
Ethete (Fremont)	7/15-8/15,58		18,000	18,000	600	1,798	3,695	6,093	0.3385
Fremont Co. Riverton Area	7/12-18,58	8,996		8,996					
Ft. Washakie Area	7/12-18,58	23,676		23,676					
Shotgun Bench	7/12-18,58	9,726		9,726					
Dinwoody Area	7/12-18,58	1,200		1,200					
Black Mtn.Area	7/12-18,58	7,360		7,360					

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Grasshopper Control — Fiscal Year 1959

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Wyoming									
Goshen Co.									
Ft.Laramie Area		34,119		34,119	$80,039	$	$62,488	$142,527	$0.51
66 Mtn. Area	7/11-19,58	8,493		8,493					
Johnson Co. (Ucross)	7/17-8/2,58	4,643		4,643					
Niobrara Co. (Hat Creek)	7/17-19/58	28,240		28,240					
Sheridan Co. (Masters Area)	7/17-8/2,58	5,320		5,320					
(Wyarno-Ucross)	7/17-8/2,58	151,665		151,665					
Total		283,438	18,600	302,038	$80,709	$1,798	$166,218	$148,725	$0.493
Grand Total		650,306	31,960	682,266	$178,360	$1,798	$171,623	$351,781	$0.501

VOLUNTARY AND COOPERATIVELY FINANCED GRASSHOPPER CONTROL,
ESTIMATES OF ACRES PROTECTED, LOSS IN DOLLARS, AND SAVINGS IN DOLLARS
AS REPORTED BY STATES
1958 GROWING SEASON

Grasshopper Control

State	VOLUNTARY CONTROL			COOPERATIVELY FINANCED CONTROL		
	Protected (Acres)	Loss Caused (Dollars)	Savings From Control (Dollars)	Protected (Acres)	Loss Caused (Dollars)	Savings From Control (Dollars)
Arizona	4,000	500	4,000	300,000	50,000	700,000
California	727,000	1,297,300	23,067,300	600	100	1,200
Colorado	2,200,000	4,000,000	12,400,000	3,000,000	5,000,000	36,000,000
Idaho	31,300	99,000	32,200	56,900	4,700	70,500
Montana	300,000	500,000	1,000,000	50,000	50,000	80,000
Nevada				75,000	5,000	220,000
New Mexico	250,000	875,000	7,563,600	400,000	267,800	630,700
Oregon	1,800	4,000	1,800			
Utah	125,000	412,100	525,000			
Washington	2,000	5,000	2,000			
Wyoming	1,420	8,000	8,900	400,000	72,500	780,000
Total	3,642,520	7,200,900	44,604,800	4,282,500	5,450,100	38,482,400

COOPERATIVE AID RECEIVED

Grasshopper Control — Fiscal Year 1959

State and Source of Aid	1 Cash and Equivalent Aid* Cash	2 Cash and Equivalent Aid* Personal Services	3 Cash and Equivalent Aid* Equipment & Supplies	4 Cash and Equivalent Aid* Space	5 Total of Cash & Equiv.	6 Intangible Service Estimate**	7 Source Grand Total	8 Remarks
State Depts. of Agriculture	$	$	$	$	$	$	$	
Arizona		1,550			1,550	1,000	2,550	
California		10,500			10,500		10,500	
Colorado		7,000			7,000	7,000	14,000	
Idaho	7,500	250			7,750		7,750	
Montana								
Nevada	3,860	3,000	400		7,260		7,260	
New Mexico	39,503	750			40,253	2,600	42,853	
Oregon						200	200	
Utah		1,245			1,245	235	1,480	
Washington						200	200	
Wyoming	31,698	7,821			39,519	645	40,164	
Counties								
California	60,000				60,000	23,000	83,000	
Idaho	2,100				2,100	450	2,550	
Montana						100	100	
Wyoming	759				759		759	
Ranchers								
Idaho	198				198		198	
Nevada	580				580	1,500	2,080	
New Mexico	39,503				39,503	800	40,303	
Oregon						200	200	
Utah		430	318		748	780	1,528	
Washington						200	200	
Wyoming	40,519				40,519		40,519	

(Continued)

COOPERATIVE AID RECEIVED (Continued)

Grasshopper Control

Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equiv.	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
Extension Service	$	$	$	$	$	$	$	
Colorado						1,000	1,000	
Idaho						600	600	
New Mexico						400	400	
Oregon						2,100	2,100	
Washington						1,550	1,550	
Wyoming						815	815	
Experiment Stations								
Colorado						500	500	
Montana						19,000	19,000	
Colleges & Universities								
California						1,000	1,000	
Washington						300	300	
USDA Forest Service								
Idaho						300	300	
Oregon						200	200	
Utah						1,544	1,544	
Washington						100	100	
State Fish & Game								
Idaho	3,850				3,850	100	3,950	

(Continued)

COOPERATIVE AID RECEIVED (Continued)

Grasshopper Control — Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equiv.	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
USDI - Indian Service	$	$	$	$	$	$	$	
Montana						447	447	
Wyoming						1,798	1,798	
USDI - BLM								
Nevada						300	300	
Oregon						200	200	
Washington						100	100	
Total	$230,070	$32,546	$ 718	$	$263,334	$ 71,264	$334,598	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

EXPENDITURES BY SOURCE AND ACTIVITY

Grasshopper Control

Fiscal Year 1959

	1	2	3	4	5	6	7	8
Source of Cash & Equivalent*	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
Plant Pest Control Division	$ 85,885	$ 78,052	$126,549	$210,190	$	$ 6,670	$10,335	$517,681
Other Organizations (Name)								
States	16,431	6,870	6,675	88,411	140	200	200	118,927
Ranchers			430	80,800			318	81,548
Counties				62,859				62,859
Subtotal Other Organizations	16,431	6,870	7,105	232,070	140	200	518	263,334
Total (of PPC & Other)	$ 102,316	$ 84,922	$133,654	$ 442,260	$ 140	$ 6,870	$10,853	$781,015

(Continued)

EXPENDITURES BY SOURCE AND ACTIVITY (Continued)

Grasshopper Control — Fiscal Year 1959

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Contributed Services**								
State Depts. of Agric.	$ 4,700	$ 3,185	$ 3,100	$ 600	$ 85	$	$ 210	$ 11,880
State Fish & Game				100				100
Ranchers	400		980	1,900			200	3,480
Experiment Stations		1,500				18,000		19,500
Extension Service	1,870	1,310	2,600	300		300	85	6,465
Universities						1,000	300	1,300
Counties	4,500	8,500	10,450				100	23,550
USDA Forest Service	320	150	1,174	450			50	2,144
USDI Indian Service				2,245				2,245
USDI - BLM	100		400	100				600
Total	11,890	14,645	18,704	5,695	85	19,300	945	71,264
Grand Total	$ 114,206	$ 99,567	$ 152,358	$ 447,955	$ 225	$ 26,170	$ 11,798	$ 852,279

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

GPO 979383

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

GYPSY MOTH

July 1, 1958 - June 30, 1959

In cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITIES

A. Accomplishment for the fiscal year

The gypsy moth problem in the Central Region is confined to the State of Michigan. Trapping and scouting during the fiscal year 1959 resulted in the location of small infestations in Clinton, Eaton, and Ingham Counties. In consultation with State officials, it was determined that 20,091 acres of land in these areas required treatment.

Actual control work was begun May 2 and completed May 13, 1959. See table on page 5 of this report for total acres found infested and treated since 1954, at which time the first gypsy moth infestation was found in Michigan.

B. Major deviation from work plan

No changes.

C. Status of program at close of year

All known infestations had been treated and trapping was in progress for fiscal year 1960.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and direction

The program was jointly planned, directed, and supervised by personnel of the Michigan State Department of Agriculture and the Plant Pest Control Division, Agricultural Research Service, U. S. Department of Agriculture.

B. Technical assistance

Technical assistance was provided by officials of the Plant Industry Division of the State Department of Agriculture and Michigan State University, with whom the Division cooperates. Division personnel at Lansing provided appropriate survey information. The control work was the joint responsibility of the Division and cooperating State Department. FAA officials at Detroit, Michigan, and Division personnel of Methods Improvement Operations, Beltsville, Maryland, assisted with the safety and mechanical aspects of the program.

C. Survey

The general trapping pattern included the setting on an average of $2\frac{1}{2}$ traps per square mile throughout the area under observation. Late June to mid-September was the period during which trapping was accomplished. The 15 moths trapped were caught

between July 31 and August 25, 1958. Scouting for egg masses or clusters occurred during the winter months. A crew of trusties from Ionia Reformatory assisted State and Federal employees with this work. A total of 12 egg masses were found in December 1958, and during early spring State and Federal personnel found an additional 65 egg masses in the infested area prior to control operations in May.

D. Eradication or control

All known infestations were treated between May 2 and 13, 1959. The acreage lay in parts of three counties--i.e., Eaton, 2,957; Ingham, 2,957; and Clinton, 14,177, for a total of 20,091. Since only wooded and brushy areas, including single trees or shrubs and fence rows, are host to the moth, open areas were not sprayed. A total of 13,949 gallons of a DDT-oil corrected to 60° was applied in the total area. Application was made by single-engine aircraft, applying a DDT-oil solution at the rate of one gallon per acre. The program cost $14,651.18, or $0.724 per acre, or $1.05 per gallon. Results were very satisfactory.

E. Regulatory

No Federal gypsy moth quarantine is in force in Michigan. State inspectors, Michigan Department of Agriculture, however, did check for gypsy moths while contacting nurserymen and dealers throughout the State in connection with regular nursery inspection work. Division and cooperating State personnel made certain that Christmas trees moving into States of the Central Region from eastern regulated areas had been properly inspected and certified at point of origin.

F. Methods improvement

Two-way radios used on the control activities, and the assistance the Methods Improvement Operations made available by providing an observation plane and pilot to supervise swath patterns of the spray planes, greatly increased the efficiency of the overall job.

G. Other

Not applicable.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

Trapping in Michigan should cover areas totaling 1,800 square miles. This will require some 18 trap tenders and about 5,000 traps.

B. Eradication or control

All infestations found in Michigan during the 1959 fiscal year should be treated under the cooperative program in the spring of 1960.

The insecticide should be a DDT-oil solution, with each gallon of finished solution to contain 1 pound of DDT, as has been the formula in the past.

C. Regulatory

Not applicable.

D. Methods improvement

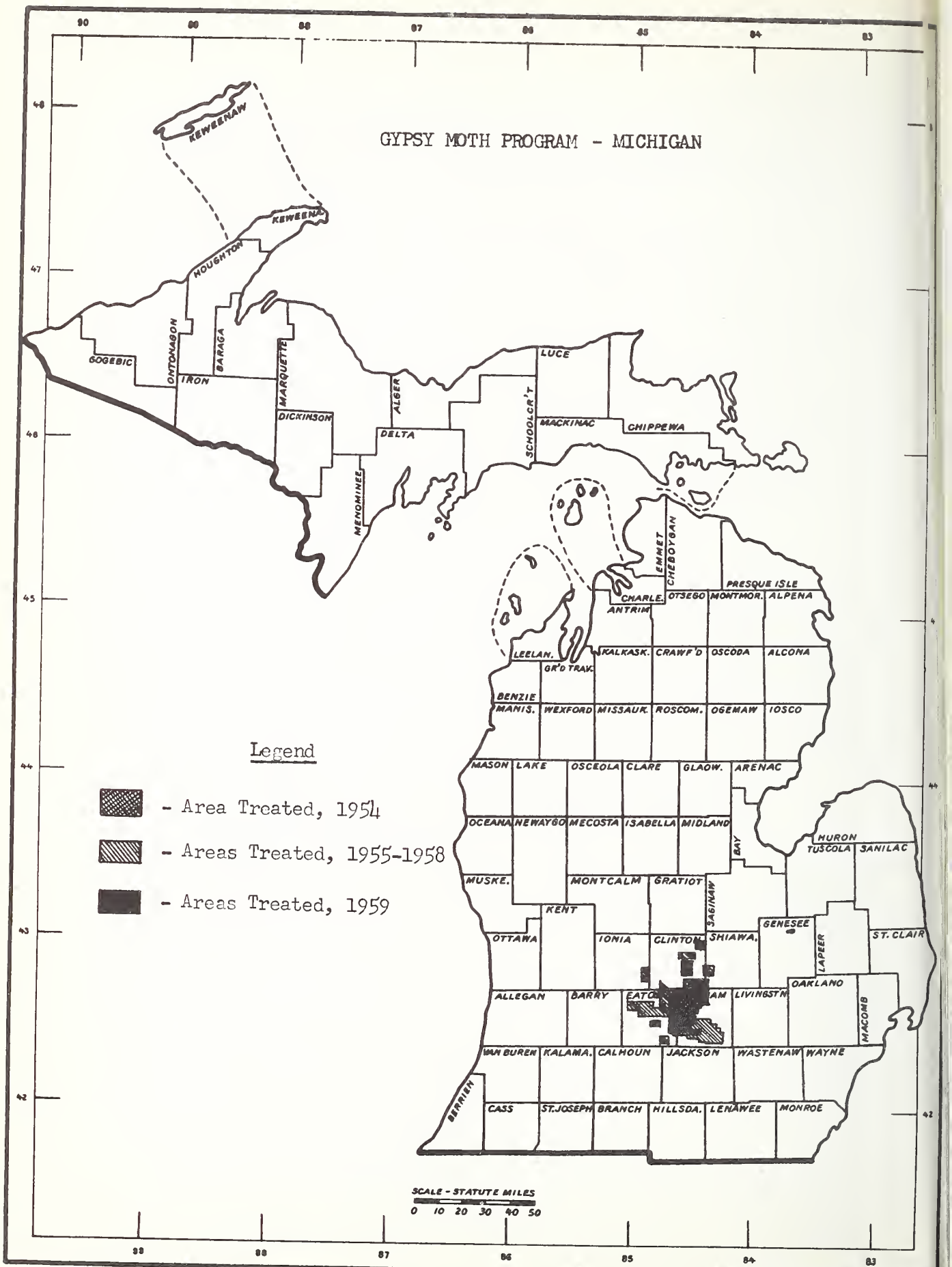
Aircraft to be used, and the type of ships under contract, should be governed by the safety aspects amenable to the area to be sprayed.

Two-way radio communications should be standard equipment on all future cooperative control programs.

Methods improvement operations should make available necessary observation planes and pilots for all future programs. The calibration of aircraft and the supervision of swath patterns of the spray planes greatly increase the efficiency of the over-all job.

E. Associated activities

Appropriate State and Division personnel should continue to co-operate with all publicity agencies that will keep the gypsy moth program aims and goals clearly before the public.



U.S. DEPARTMENT OF AGRICULTURE

BUREAU OF AGRICULTURAL ECONOMICS

Gypsy Moth Program - Michigan
1954 - 1959

County	Year	Year First Infested	Survey: Male Moths Trapped: Number	Male Moths Trapped: No. of Locations	Egg Masses Found: Number	Egg Masses Found: No. of Locations	Acres Sprayed
Clinton	1954	-	-	-	-	-	9,440
	1955	X	2	2	12	1	3,840
	1956	-	-	-	-	-	9,600
	1957	-	-	-	-	-	480
	1958	-	13	5	12*	1	-
	1959	-	-	-	65*	-	14,177
Eaton	1954	X	50	3	50	1	18,880
	1955	-	24	15	-	-	23,040
	1956	-	1	1	-	-	37,600
	1957	-	-	-	-	-	14,720
	1958	-	1	1	-	-	-
	1959	-	-	-	-	-	2,957
Ingham	1954	X	-	-	4,000	4	58,080
	1955	-	5	5	1	1	6,530
	1956	-	-	-	-	-	50,060
	1957	-	-	-	-	-	-
	1958	-	1	1	-	-	-
	1959	-	-	-	-	-	2,957
Ionia	1954	X	1	1	-	-	-
	1955	-	-	-	-	-	2,560
	1956	-	-	-	-	-	-
	1957	-	-	-	-	-	-
	1958	-	-	-	-	-	-
	1959	-	-	-	-	-	- -
Shiawassee	1954	-	-	-	-	-	-
	1955	-	-	-	-	-	-
	1956	X	1	1	-	-	1,600
	1957	-	-	-	-	-	3,680
	1958	-	-	-	-	-	-
	1959	-	-	-	-	-	-
Totals			99	35	4,140	8	260,201

*12 egg masses found on 3 oak trees in December and 65 in a shed in March--both at same location.

Gypsy Moth - Accomplishments, Fiscal Year 1959

State	Survey Outside Regulated Area				Acres Sprayed			
	Number of			Infestations Located by	Eradication		Suppression	
	Traps in Use	Traps Catching	Moths Trapped	Finding Eggs or Larvae Only	Federal Contract	State and Other	Federal Contract	State and Other
Michigan	3,954	7	15	1	20,091	0	0	0
Totals	3,954	7	15	1	20,091	0	0	0

No survey inside regulated area, no defoliation found, no certification services.

Gypsy Moth - Summary of Associated Activities - Fiscal Year 1959

State	Public Meetings Attended	Presentations: Talks	Slides	Films	Radio	TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins	Circulars	Infest. Maps & Posters	Other
FEDERAL												
Michigan	0	6	0	11	0	0	2	0	80	0	0	640***
Minnesota	0	0	5	0	0	0	0	0	0	0	0	0
Subtotals	0	6	5	11	0	0	2	0	80	0	0	640
COOPERATORS												
Michigan	0	6	0	4	3	0	0	0	0	0	0	0
TOTALS	0	12	5	15	3	0	2	0	80	0	0	640

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.
***Newsletter to cooperators.

Gypsy Moth - Cooperative Aid Received - Fiscal Year 1959

State	Cash and Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Indiana	0	0	0	0	0	200	200
Michigan	$30,000	$4,000	0	200	$34,200	$1,000	$35,200
Ohio	0	0	0	0	0	300	300
Totals	$30,000	$4,000	0	$200	$34,200	$1,500	$35,700

*Limited to direct appropriation, allotments from other sources, services and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

Gypsy Moth - Expenditures by Source and by Activity - Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	$4,700	$1,200	$12,800	$23,500	$1,200	0	0	$43,400
Other Organizations:								
Michigan	4,000	0	24,200	6,000	0	0	0	34,200
CONTRIBUTED SERVICES**								
Indiana	0	0	200	0	0	0	0	200
Michigan	0	0	0	0	1,000	0	0	1,000
Ohio	0	0	300	0	0	0	0	300
Totals	0	0	500	0	1,000	0	0	1,500
GRAND TOTALS	$8,700	$1,200	$37,500	$29,500	$2,200	0	0	$79,100

*Direct approp., allotments other sources, services & supplies for which there is a definite replacement value.

**Services incidental to other activities, for which only an estimated value is available.

(*--*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

GYPSY MOTH

July 1, 1958 - June 30, 1959

COOPERATING AGENCIES:

State Departments of Agriculture
Conservation and Forest Service
Experimental Stations, Extension Service
Plant Pest Control Division, Entomology Research Division
and
Northeast Forest Experiment Station, U. S. Forest Service
of the
United States Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During the summer of 1958, a total of 33,582 traps were employed to survey approximately 16 million acres, including all areas sprayed in 1956, 1957 and 1958. All the suppressive area was trapped, plus a belt of territory in the non-regulated area immediately south and west of the quarantine line in New York, New Jersey and Pennsylvania. Results of this survey in Pennsylvania were negative and only one male moth was recovered in New Jersey. No moths were caught outside the regulated area in New York or in the sprayed area on Long Island. Only two single moths were caught within the sprayed area in Putnam County, New York.

Eradication spraying of 85,560 acres was accomplished in the spring of 1959, using Sevin as the insecticide. The area sprayed was in the periphery of general infestations in the counties of Delaware and Otsego, New York. The program posed several serious problems in connection with the formulation and application of this new insecticide. A complete evaluation of its effectiveness in comparison to DDT must await follow-up trapping and scouting surveys.

To suppress populations within the generally infested area, DDT control treatments were made on a 300 acre infestation at Barnstable, Massachusetts and on 8,500 woodland acres in northwestern Connecticut. Spraying was completed on 35,293 acres in Rhode Island with the cooperation of the Rhode Island Department of Agriculture and Conservation. The State of Vermont sprayed 217 acres in Charlotte, Shelbourne and Salisbury.

During the spring of 1958 a sex attractant procurement program was conducted in Spain which netted 900,000 tips from 2,005,000 pupae collected. A subsequent survey in Morocco served as basis for a similar program undertaken there in June 1959. In the summer of 1958, 76,449 tips were recovered from 269,055 pupae collected in Connecticut.

Regulatory activities were continued with special emphasis toward control of the movement of native plant material. Informational activities were conducted to advise the public of quarantine requirements. In this connection, a new gypsy moth poster was issued for use at summer camps, trailer parks, etc. A new quarantine map was also issued and distributed to those concerned.

Method improvement activities were intensified during this fiscal year. Experimental trap lines were operated in southern New Hampshire to test synthetic attractants for gypsy moth traps; to test disposable-type paper traps and liners; to investigate toxicants in traps as substitutes for tanglefoot; and to compare the

effectiveness of carbon tetrachloride and benzene as extraction solvents.

Test spraying was done on two ponds in New York State to determine the effect of insecticidal sprays on fish when applied directly over ponds. Experimental plots in the Bethany-Waterbury, Connecticut area were sprayed with various insecticides and a special study conducted to determine their effect on wildlife. Treatments were also made with Bacillus thuringiensis, wilt virus and nematodes.

Two New York pastures were sprayed with Thiodan and Sevin to determine their residual properties on forage. Sevin formulations with stickers were also screened in tests on laboratory-reared gypsy moth larvae at East Haven, Connecticut.

B. Major Deviation from Work Plan

At the beginning of the year, plans were formulated to resume the progressive eradication program conducted in New York during 1956 and 1957 but suspended in 1958 pending development of a substitute insecticide for DDT in agricultural areas. By March, 700,000 acres had been tentatively set up for spraying with Sevin, but subsequent revisions culminating in a limitation as to the amount of insecticide available to the Division, reduced the scope of the program to less than 100,000 acres.

C. Status of Program at close of Year

At the close of the year there was no known gypsy moth infestation in New Jersey and Pennsylvania, or in non-regulated or sprayed areas in New York. Within the New York suppressive area, five small infestations were found in the unsprayed section of eastern Delaware County and a single small infestation in Putnam County, sprayed in 1957.

Scouting and defoliation surveys throughout the generally infested area disclosed only a few small areas where moth populations had built up to proportions demanding suppressive treatment. Only 125 acres of defoliation was observed. However, during the spring of 1959, the hatch of egg masses approached 100 percent in most of the area, and continued favorable climatic conditions should result in widespread upsurge of the insect in the next year or two.

II. Program Activity During Fiscal Year

A. Planning and direction

The program was planned and directed by the Regional staff and PPC Supervisors, in consultation with State Cooperators. Policy matters were discussed at the Division level. Federal and State research associates participated in planning methods improvement, developmental

and research activities.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel

Program personnel furnished technical information and assistance to cooperating State and local agencies, and to affected industries and individuals concerned with quarantine and control requirements.

2. Technical assistance provided to program by cooperating agencies

Federal and State research units and industry participated in cooperative tests and studies to develop and improve methods and procedures applicable to survey, control, and regulatory activities. Major emphasis was in connection with problems associated with the eradication program and the development of a synthetic trap lure.

In New York, staff members of the Department of Entomology of Cornell University, the State Extension Service, and the College of Forestry at Syracuse worked closely in an advisory capacity in connection with the eradication program. Extensive studies of the effect of Sevin on bees were conducted throughout the spray program by Cornell specialists. Experts from the Division of Fish and Game of the New York Conservation Department made observations of the effect of that insecticide on aquatic life in streams.

C. Survey

1. Procedures and techniques used

a. Field

Three types of survey were employed; namely, trapping, scouting, and defoliation. Sex attractant traps were used extensively in survey operations for determining distribution of the moth, delimiting areas of infestation, and checking effectiveness of spray operations. The method of trap placement most commonly used was the 7/8 mile grid or modified grid, resulting in systematic coverage in all sprayed and peripheral areas. At distant locations outside the regulated area, traps were placed at selected points along highways, with emphasis on recreational areas and other sites likely to attract transient and tourist traffic. Traps were also placed at selected locations within the regulated area in determining population trends for regulatory and control purposes.

Intensive scouting was conducted around isolated positive trap sites in peripheral and sprayed areas to confirm infestation. A less intensive type of scouting was conducted in the periphery of general infestation to determine the western limits of the contemplated spray program. A considerable amount of scouting was also conducted within the area of general infestation by State cooperators to determine moth population trends on which to base control measures and prevent defoliation.

Cooperative aerial observations were made in all infested states to detect extent and severity of defoliation.

b. Laboratory

Not applicable

2. Accomplishments

In New York, 12,870 traps were used to survey 5,702,281 acres in all or parts of 27 counties in the state. Nearly three-quarters of the traps were used to survey the entire suppressive area on a grid or modified grid pattern. In the non-regulated area a strip of territory ranging from 10 to 25 miles in width abutting the regulated area and extending from the Pennsylvania line north to Oneida and Herkimer Counties was also systematically trapped. A total of 194 traps were placed at intervals along main highways in six counties in the Finger Lakes Region. Within the generally infested area, 171 traps were employed to supplement information on infestation for regulatory purposes.

No moths were recovered outside the regulated area. Within the suppressive area, male moths were recovered only in eastern Delaware County and in Putnam County. In eastern Delaware County (not sprayed for eradication), 46 male moths were recovered at 12 trap sites in five townships, all catches were near locations where male moths were captured the previous year. In Putnam County, two traps caught single moths in two townships (sprayed).

Within the generally infested area in Dutchess County, 20 traps used as checks caught 71 moths in two townships, at sites located outside or just inside the 1957 spray area. Regulatory trapping in three quarantined counties to the north resulted in the capture of a single male moth in Clinton County.

Scouting conducted around positive trap sites in the suppressive area resulted in the finding of five small infestations in three townships in eastern Delaware County and one small infestation in Putnam County. Scouting conducted in the generally infested area by State personnel disclosed that the gypsy moth population was still at a low ebb. Less than 500 acres were found which

had infestation of sufficient intensity to be included in plans for suppressive spraying.

In New Jersey, the trapping program was the most extensive one ever conducted in that state. A total of 6,131 traps were set on the 7/8 mile grid pattern to survey 60% of the state's land area. The results of this survey were negative with the exception of a single moth capture at Hibernia. Intensive scouting around this positive trap site was negative.

In Pennsylvania, a total of 13,150 traps were used to survey an area of approximately 7,400,000 acres in 23 northeastern counties of the state. Results were negative. In addition, sites in Bucks County where male moths were caught in 1957, and some sites of earlier infestation were intensively scouted, also with negative results.

In the non-regulated section of New England, 580 traps were used to detect any northeasterly spread in Maine. Traps were set at selected sites along highways in 81 towns, east of the regulated area to the Canadian border and north to the Aroostook County line. No male moths were recovered. Scouting surveys at selected locations in non-regulated sections of Vermont and New Hampshire were also negative.

A total of 850 traps set in national forests and selected sites along highways in Maryland, Delaware, Virginia, and West Virginia captured no moths.

Division and cooperating State agency personnel conducted scouting surveys throughout the generally infested area to locate possible outbreak centers and to determine population trends. Results of these surveys indicate that in general, gypsy moth populations remain at low levels, with some build-up at scattered locations.

The Bureau of Insect Pest Control, Massachusetts Department of Natural Resources, employed 1,590 traps in Plymouth, Norfolk, Bristol, Barnstable and Dukes Counties to detect any reestablishment of infestations in areas previously sprayed in these counties. In the areas trapped, 99 traps attracted 346 male moths.

3. Statement of Pest Damage

During the summer, cooperative aerial surveys were conducted in all infested states to detect extent and severity of defoliation. These surveys disclosed only 125 acres of defoliation, the lowest acreage ever recorded since the surveys were initiated in 1924. Eight acres of defoliation were observed west of Hyannis in Barnstable County, Massachusetts, and 117 acres in the towns of Wolcott and Hamden in Connecticut.

SUMMARY OF GYPSY MOTH DEFOLIATION - FY 1959
Summer of 1958

Acreage Defoliated and Degree of Defoliation

State	Less than 75%	75-100%	Total
Connecticut	111	6	117
Massachusetts	8	0	8
Total	119	6	125

No defoliation was observed in Maine, New Hampshire, Vermont, Rhode Island, New York, and Pennsylvania

D. Eradication or Control

1. Procedures or techniques used

Preliminary aerial surveys were conducted over proposed spray areas to develop information on spray boundaries, type of terrain, sensitive areas and hazards, and to estimate spray plane needs. These surveys were followed by intensive ground checking, together with preparation of maps, instructions, and other details pertinent to spray operations. After estimates on acreage, gallonage, and plane requirements were determined, spray bid specifications were prepared and distributed to prospective bidders. About the same time program information was released by cooperating agencies through newspapers, radio and TV channels, and meetings were held with local interested groups.

Until this season, DDT at the rate of one pound in one gallon of oil diluent per acre was used for eradication spraying. This year, Sevin, a new carbamate material, was used at the rate of 1¼ pounds of technical material in one gallon of oil diluent per acre. Large-type planes were used in applying sprays on woodlands. Small-type planes were used primarily for spraying host growth in open country. All spray planes were checked for calibration and swath width by the Division's aircraft specialists who also were available throughout the program to check spray operations from the air. Application was also observed by ground crews who used oil-sensitive dyed cards to check spray deposits. Observation pilots and ground crews were equipped with radios to relay information to the operating base and to receive instructions. Helium-filled kytoons were used extensively to mark spray boundaries and flight strips, and to spot areas requiring special precautions and precise application.

Within the generally infested area, cooperating State agencies applied DDT at the rate of 1/2 to 1 pound in one gallon of oil diluent per acre, by plane or mist blowers.

2. Accomplishments

The eradication programs involved the aerial treatment of 85,560 acres with 73,610 gallons of Sevin insecticide. The areas selected for treatment were generally but very lightly infested, embracing a portion of southeastern Otsego County and northern Delaware County. The size of the area to be sprayed was limited by the availability of Sevin, and the amount procured by the Division permitted the formulation of 75,000 gallons of finished spray.

The Union Carbide Corporation formulated Sevin into an oil suspendable powder labeled Sevin 85-P which was delivered to the operations base at the Cooperstown-Westville Airport, Westville, New York. Separate contracts were drawn for formulation and for application. The formulation contract was awarded to United Heckathorn and the application contract to Ueding Flying Service.

Mixing operations were conducted at the operations base. The finished insecticide spray consisted of 1½ pounds of Sevin 85-P suspended in sufficient No. 2 fuel oil to make one gallon. Paraffin at the rate of 0.1 pound per gallon had been incorporated with the fuel oil as a sticker prior to its delivery at the operations base. Mixing was accomplished by circulating the fuel oil-paraffin solution through two Venturi systems. The Sevin 85-P powder was drawn from hoppers and incorporated with the fuel oil-paraffin solution by the Venturi tubes, pumped into a 1600 gallon mixing vat, and recirculated through the Venturis until an 800 gallon batch was mixed. From the vat the finished spray was pumped into a 10,000 gallon storage tank in which around-the-clock agitation was employed to keep the insecticide in suspension. Because of the sudsy nature of the finished spray, metering difficulties were encountered. Clogging of pump and meter screens with sludge was also a problem.

Spraying commenced on May 21 and was completed on June 11. Two Grumman TBM aircraft and four Stearman 450 hp. bi-planes were used. Because of delay in arrival of the TBM's, the Stearmans upon completion of spraying in open country were used to spray some of the areas originally assigned to TBM's. Observation aircraft included one Cessna 182 furnished by the contractor and two Cessna (182 and 180) furnished by the Division. Program personnel included 20 from the Division; 4 from the New York State Conservation Department, and 2 from the New York Department of Agriculture and Markets.

Observations by field personnel indicated that the spray did not appear to disperse as well, or adhere as well, to foliage as DDT oil solution. Also, that Sevin is not as effective as DDT for eradication.

Aircraft Used in 1959 Eradication Program

Type of Aircraft	No. Used	Avg. Load (gal.)	No. Trips	Total Gal. Sprayed	Total Area Sprayed
Grumman TBM	2	585	66	38,580	38,580
Stearman 450 hp	4	163	215	35,030	46,980
	6	-	281	73,610	85,560

A total of 50 acres was treated with DDT in the suppressive area for eradication with ground equipment.

Within the generally infested area, cooperating State and local agencies sprayed 44,770 acres of heavily infested woodlands to suppress populations and prevent defoliation. See Table #2.

E. Regulatory

1. Procedures or techniques used

Regulatory activities are directed toward prevention of artificial spread of the moth into areas where eradication treatments have been applied (the suppressive area) and into non-infested sections of the country and Canada. Interstate movement of nursery stock, forest and quarry products, and other commodities which constitute a hazard of spread is regulated under Federal Quarantine No. 45. Intrastate movement of such products is regulated under paralleling State quarantines. With certain exceptions, shipments of regulated products moving from regulated areas must be accompanied by a certificate or limited permit. Certain regulated articles may be moved under a Certificate of Exemption issued to establishments found free of infestation or when approved insecticides have been applied.

2. Accomplishments

Inspectors stationed throughout the regulated area furnished inspection and certification services and information to regulated industries, shippers, and others throughout the year. Inspectors outside the regulated area furnished quarantine information to shippers and checked movement of regulated products for quarantine compliance.

Articles valued at more than 26½ million dollars were certified for movement during the year. A total of 21,687 service calls were made by inspectors.

A special agreement between the Maine Forest Service and pulp mills in central and eastern Maine was signed May 7. This agreement permits intrastate movement of uncertified pulpwood

to non-regulated destinations. The agreement will continue in effect from year to year until conditions of pest risk are such that the continuance of the agreement would be hazardous from a pest spread standpoint.

In January, the Plant Protection Division of the Canadian Department of Agriculture issued instructions to customs officials, charged with enforcement of protective quarantines along the Canadian border, to recognize the Federal gypsy moth quarantine exemption for certain quarry and forest products. Certification of these certain exempted products moving into Canada is no longer required.

On October 1, 1958, the New York Department of Agriculture and Markets issued a directive concerning certification of Christmas trees and boughs, supplementing State Regulation 12 of New York Quarantine Order No. 3. This specifically required that all shipments of Christmas trees and boughs entering the state of New York or being moved within its borders be accompanied by a valid certificate of inspection issued by a plant or nursery inspection official of the state or country of origin. This order had no relationship to the gypsy moth quarantine. Cooperating State regulatory agencies requested assistance in providing the necessary inspection and certification services. Such assistance was provided in areas where program inspectors were inspecting and certifying these products for movement from gypsy moth regulated areas. On May 27, 1959, the New York State Department of Agriculture and Markets rescinded its directive of October 1, 1958.

F. Methods Improvement

1. Work performed

Experimental trap lines were operated in the vicinity of Nashua, New Hampshire in cooperation with Pesticide Chemicals Research Branch to screen synthetics for attractancy to male moths; to test disposable-type paper traps and liners; to check the efficacy of various containers for shipping impregnated cartridges; to investigate the use of toxicants in traps as substitutes for tanglefoot; and to compare the effectiveness of carbon tetrachloride and benzene as extraction solvents. Experiments were also conducted to develop a bioassay method of determining attractancy to male moths in the laboratory to eliminate dependence upon once-a-year field testing.

Two ponds in the Adirondack region of New York were sprayed by air with quick-breaking DDT emulsion and one with Thiodan to check the effect of these insecticides on fish. All three ponds had been scheduled for fish elimination by the New York Conservation Department preparatory to restocking with desired species.

To determine the residual properties of Thiodan and Sevin on forage, two pastures near Fulton, New York were sprayed with one pound of each material per acre. Emulsifiable Thiodan and Sevin suspensions were diluted to one pound per gallon with No. 1 fuel oil.

As a follow-up to the 1958 field testing of laboratory screened insecticides by aircraft application in northern New York, personnel scouted fourteen 3-acre check plots to determine egg deposition.

Screening tests involving Sevin formulations with various stickers, as well as other insecticides on laboratory-reared gypsy moth larvae were conducted during the winter at East Haven, Connecticut in cooperation with Pesticide Chemicals Research Branch personnel. Eggs and first instar larvae were furnished for the tests by the Northeastern Forest Experiment Station laboratory at New Haven.

Experimental plots in the Bethany-Waterbury, Connecticut area and near Ferrisburg, Vermont were treated by air to evaluate Sevin combined with various stickers, malathion, Bayer 22408, phosphamidon, and Dibrom. In addition, treatments were made with Bacillus thuringiensis, wilt virus, and nematodes. A special study was undertaken in the Connecticut spray plots by a wildlife biologist to determine the effect of insecticides on wildlife, particularly songbirds.

2. Accomplishments

Out of 973 synthetics tested, one, ENT-25,315X, caught significant numbers of male moths. Its epoxide and corresponding diol were scheduled for large scale field tests during the summer of 1959. Two disposable-type paper traps proved to be inferior to the standard metal trap. Likewise, the paper liners tested were unsatisfactory. Out of 10 containers tested, aluminum foil, a plastic-type bag, a seamless tin ointment box, and an ointment jar appear to hold promise as replacements for the quart-size Mason jars currently used to ship impregnated cartridges. Indications are that lindane or Hercules 5727 impregnated on attractant cartridges and used in conjunction with mosquito netting or bristle-type barriers over the trap end openings, may be effective as a substitute for tanglefoot. Although nonflammable, carbon tetrachloride, because of its high specific gravity causing moth tips to float and its high cost, proved to be a poor substitute for benzene as a tip extractant. A qualitative laboratory bioassay method was developed for use in screening fractions of the natural attractant and synthetics based on the response of male moths. Candidate attractants were held near the insects with their wings secured by spring-type clothes pins.

Spraying the three Adirondack ponds with quick-breaking DDT emulsion resulted in considerable fish mortality in one pond; a lesser amount in the second. Thiodan caused a 100 percent kill of fish.

Samples of forage sprayed with Thiodan and Sevin near Fulton, New York were taken by Cornell University personnel for residue analysis.

Scouting of experimental spray plots in northern New York indicated that at the one-pound per acre dosage, Bayer 22408, Thiodan, Malathion, and Sevin were highly effective.

As a result of the screening tests with laboratory reared larvae at East Haven, Connecticut, Sevin suspended in a solution of No. 2 fuel oil and paraffin was selected for extensive field testing and the eradication program in New York State.

Preliminary observations of field spray tests in Connecticut and Vermont indicated that Sevin was highly effective against gypsy moth larvae in both oil and water suspensions although some plant injury was caused by the former. No measurable results were obtained with the insect pathogens. A high initial kill was obtained with dibrom and phosphamidon was found to be very effective. A final analysis of the tests will be made after egg deposition.

G. Other

1. Cooperation received during fiscal year

a. Major contributions received

State pest control agencies cooperated in varying degrees in program work by furnishing manpower, transportation, office space and some clerical help. Regulated industries and the public cooperated in the regulatory phase of the program. County Agents provided information relative to the spray program and other program activities. Newspapers, radio and TV stations also cooperated in disseminating program information.

The New York Conservation Department assigned specialists to the eradication program to make studies of the use of Sevin on acquatic life. Also, made available several ponds on which to spray various insecticides to determine their effects on fish. The Department of Entomology at Cornell University conducted tests on the effects of Sevin when fed to cattle and also assigned experts to the eradication program to study effects of Sevin on bees.

Units of the Entomology Research Division, ARS, conducted laboratory and field tests with various insecticides in an effort to find a substitute for DDT. The Connecticut Experiment Station and the Vermont Department of Forests and Parks participated in these tests.

The sex attractant procurement program in Spain was carried out in cooperation with the Servicio de Plagas Forestales. This organization provided experienced supervisory personnel and arranged for the hiring of local workers for field and laboratory activities.

b. Cooperative work needing strengthening another year

There is need for strengthening understanding of State financial and other responsibilities associated with planning and execution of the cooperative spray program.

2. Associated activities

a. Program servicing

The color sound film and colored slides were shown on several occasions before small conservation or civic groups. In most instances, PPC personnel accompanied the showings with talks.

Gypsy moth exhibits were displayed at several county fairs. The new Division exhibit was displayed at the International Flower Show in New York City in March and attracted considerable attention.

Several thousand pamphlets were distributed to interested groups and individuals in the course of the year. Prior to the start of various programs, such as Christmas tree inspection, spraying and trap surveys, news releases were distributed to papers in the areas involved. During the spray program, radio facilities were also used.

H. Procurement of Sex Attractant Material

The gypsy moth trapping program is dependent upon an ample supply of sex attractant used to lure male moths into traps. In addition, a certain amount of this material is set aside for Pesticide Chemicals Research Branch for use in isolating and determining the structure of the active components.

1. Procedures and techniques used

Sex attractant material is obtained by collecting female pupae in the field in this country or abroad, aging the emerged moths for approximately 24 hours, and clipping the two posterior

abdominal segments of the virgin moth, commonly referred to as "tips", into thiophene-free benzol or other suitable solvent. The resultant extract is then concentrated and stabilized by the process of hydrogenation.

2. Accomplishments

Out of a total of 269,055 female pupae collected at Wolcott and Hamden, Connecticut, 76,449 tips were clipped into thiophene-free benzol.

In Spain, 900,000 tips were recovered from 2,005,000 female pupae collected in the vicinity of Ciudad Rodrigo and Golpejas in western Salamanca Province. The program was conducted in cooperation with the Servicio de Plagas Forestales and under the general supervision of a Division representative. Native workers were utilized for both field and laboratory activities.

Upon completion of activities in Spain, a survey was undertaken in nearby Morocco to determine the possibilities of obtaining sex attractant in that country the following year. As a result of this survey, a pupal collection program was undertaken in Morocco in June 1959.

III. Recommendations for coming year

A. Survey

Systematically trap survey all areas sprayed for eradication, including the entire suppressive area to determine effectiveness of treatments and essential regulatory actions. Continue systematic trap surveys in non-regulated areas.

Scout positive trap sites in the suppressive and non-regulated areas to confirm infestations and establish limits of needed spray application. Survey in advance all territory proposed for eradication spraying to obtain information essential to development of spray plans.

B. Eradication or Control

There is no present indication that necessary unified State support for an overall eradication effort is available. It also appears that an effective and practical substitute for DDT will not be available for use in the immediate future. It is recommended that cooperative consultations at the policy making level be held to determine the objective and scope of future control operations and to clarify understanding.

C. Regulatory

Continuation of the quarantine endeavor is essential. It is recommended, however, that consideration be given at an early date to revision of the current quarantine regulations and administrative instructions.

D. Methods Improvement

Continue testing of insecticides and formulations in search for one that is effective in eradication of the gypsy moth that can be applied without restrictions.

There is continuing need for a more effective method of guiding spray aircraft to obtain precise application and complete coverage.

Continue efforts to improve the type of trap and trapping methods, and development of a synthetic lure.

E. Associated activities

Continue to keep the public well informed on all program activities by increased use of films, slides, projectographs, and exhibits. Also, by newspaper releases, radio and TV presentations.

GYPSY MOTH

TABLE #1

EASTERN REGION — FISCAL YEAR 1959

STATE AND COUNTY	SURVEY								
	OUTSIDE REGULATED AREA				INSIDE REGULATED AREA				
	NUMBER OF			Infestations Located by Finding Eggs or Larvae Only	NUMBER OF			Infestations Located by Finding Eggs or Larvae Only	Acres Defoliated by Gypsy Moth
	Traps in Use	Traps Catching	Moths Trapped		Traps in Use	Traps Catching	Moths Trapped		
A	B	C	D	E	F	G	H	I	J
Connecticut	-	-	-	-	-	-	-	-	117
Delaware	115	-	-	-	-	-	-	-	-
Maine	581	-	-	-	-	-	-	-	-
Maryland	335	-	-	-	-	-	-	-	-
Massachusetts	-	-	-	-	1590	100	349	-	8
New Hampshire	-	-	-	-	-	-	-	-	-
New Jersey	6131	1	1	-	-	-	-	-	-
New York	3515	-	-	-	9355	39	120	6	-
Pennsylvania	13150	-	-	-	-	-	-	-	-
Rhode Island	-	-	-	-	-	-	-	-	-
Vermont	-	-	-	-	-	-	-	3	-
Virginia	250	-	-	-	-	-	-	-	-
West Virginia	150	-	-	-	-	-	-	-	-
Washington D. C.	-	-	-	-	-	-	-	-	-
Total from July 1	24227	1	1	-	10945	139	469	9	125
Grand Total Since April 1, 1956	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	49741

PPC 7-7

GYPSY MOTH

TABLE #2

EASTERN REGION

FISCAL YEAR 1959

STATE AND COUNTY A	ACRES SPRAYED				CERTIFICATION SERVICES		
	ERADICATION		SUPPRESSION				
	Federal Contract B	State and Other C	Federal Contract D	State and Other E	Shippers Serviced F	Total Service Calls G	Estimated Value Products Certified H
Connecticut	-	-	-	8500	XXX	2807	3194596
Delaware	-	-	-	-	XXX	79	-
Maine	-	-	-	-	XXX	2624	3924576
Maryland	-	-	-	-	XXX	53	-
Massachusetts	-	-	-	300	XXX	2729	1057327
New Hampshire	-	-	-	-	XXX	1586	2687247
New Jersey	-	-	-	-	XXX	-	-
New York	85610	-	-	460	XXX	7070	12439527
Pennsylvania	-	-	-	-	XXX	-	-
Rhode Island	-	-	-	35293	XXX	500	641302
Vermont	-	-	-	217	XXX	3880	2695945
Virginia	-	-	-	-	XXX	206	-
West Virginia	-	-	-	-	XXX	139	-
Washington D. C.	-	-	-	-	XXX	14	-
Total from July 1	85610	-	-	44770	XXX	21687	26640520
Grand Total since April 1, 1956	3958313	223757	40202	689351	XXX	68204	76846596

PPC 7-7A

TABLE #3

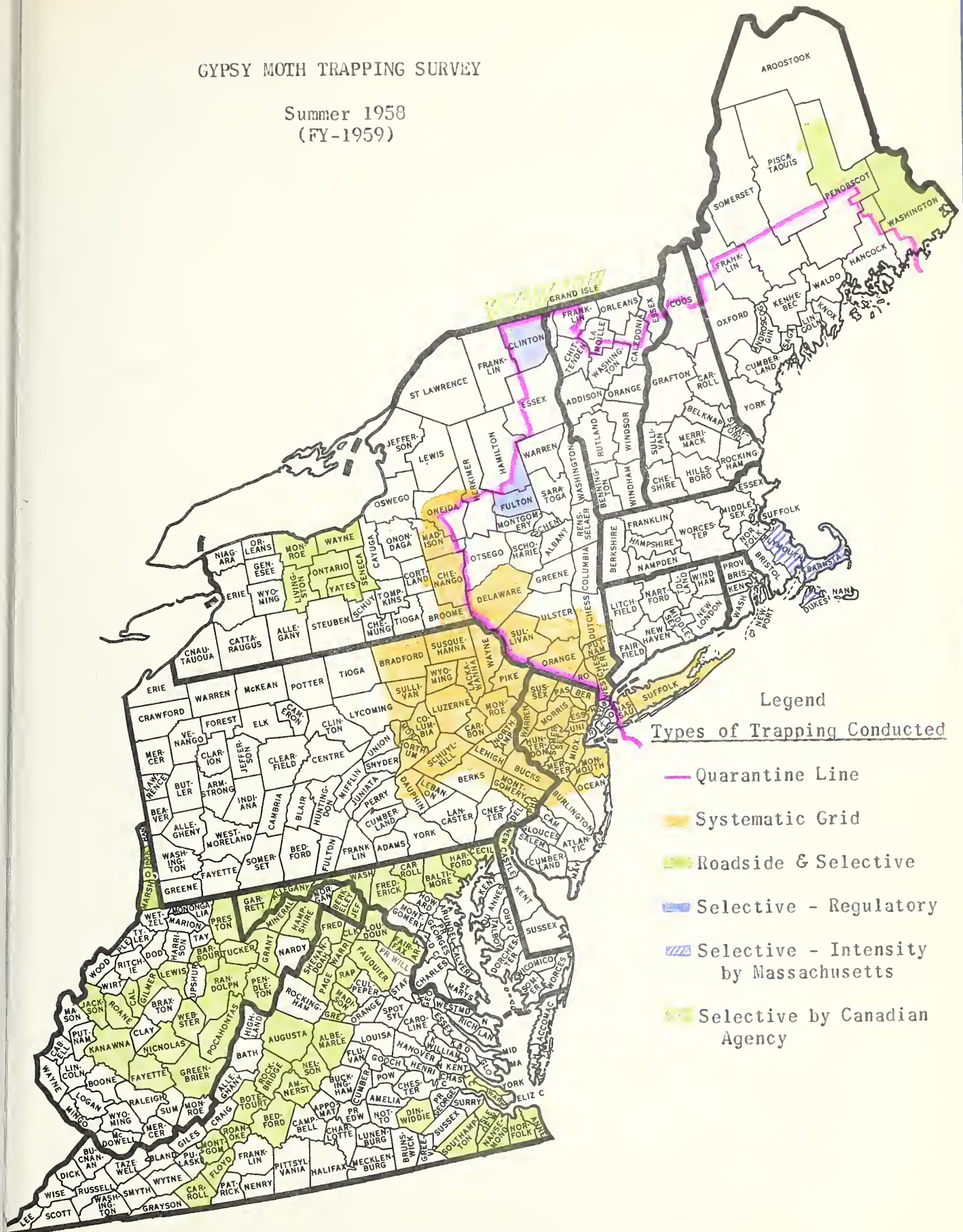
SUMMARY OF GYPSY MOTH SPRAYING - FY 1959

STATE	AIRCRAFT		BLOWER		TOTALS
	Federal Contract (acres)	State & Other (acres)	Federal (acres)	State (acres)	(acres)
Maine	0	0	0	0	0
New Hampshire	0	0	0	0	0
Vermont	0	217	0	0	217
Massachusetts	0	300	0	0	300
Rhode Island	0	0	0	35,293	35,293
Connecticut	0	8,500	0	0	8,500
New York	85,560*	460	50*	0	86,070
	85,560*	9,477	50*	35,293	130,380

*Sprayed for eradication

GYPSY MOTH TRAPPING SURVEY

Summer 1958
(FY-1959)





HALL SCALE

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

HALL SCALE ERADICATION

July 1, 1958 - June 30, 1959

In cooperation with
Federal, State, and County Agencies

December, 1959
Oakland, California

Jim R. Dutton
Regional Supervisor

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

The final treatment of all known areas of infestation was completed during the fiscal year 1958. Therefore, all activities of the Hall Scale Eradication Program during the current fiscal year have been directed toward detection and survey.

Most of the areas of infestation have received three complete inspections as planned, with a total of 61,321 hosts inspected on 3,605 properties. In addition, 10,823 hosts were inspected on 376 properties in outlying districts, resulting in a grand total of 72,144 hosts inspected on 3,981 properties. All inspections were negative.

A Superior Service Unit Award in recognition of exceptional group performance in successfully carrying out the Hall Scale Eradication Program was announced at the Honor Awards Ceremony held at the Sylvan Theatre, Washington, D. C., May 26, 1959. The citation read:

> "For an outstanding contribution to the progress of Entomology in successfully eradicating Hall scale, an incipient insect pest, from the United States."

Major Deviation from Work Plan

Adverse weather conditions prevented the planned completion of the Rath area.

Status of Program at Close of Year

The third and final inspection of all known and suspect areas was completed, with the exception of the Rath area. During the second inspection, 8,394 hosts were checked, and 11,124 were checked during the third inspection. Approximately 22,000 hosts remain to be inspected. This will complete the inspection planned for the fiscal year.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

Yearly conferences to formulate plans for the year's activity are held with the cooperating agencies; namely,

California State Department of Agriculture and the Departments of Agriculture of Yolo and Butte Counties. The Chief of the Bureau of Entomology represents the California Department of Agriculture, the County Agricultural Commissioners represent the Counties, and the Plant Pest Control Division is represented by the State Plant Pest Control Supervisor in Charge and the District Supervisor. Actual field supervision of the inspection activities is a direct responsibility of the Plant Pest Control Division.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

None

Technical assistance provided to program by cooperating agencies

The identification of specimens by taxonomists of the California State Department of Agriculture was the only technical assistance required.

Survey

Procedures or techniques used

Intensive inspection by trained personnel is required to find this small scale insect. Hand lenses are needed in the field to aid in the discovery and collection of specimens. All scales similar in appearance to Hall scale are sent to the State taxonomist for identification. Inspection consists of closely examining current growth nodes, fruiting spurs, and bark recesses. Ladders are needed for thorough and efficient inspection of large trees. The work is a slow, painstaking operation which requires patience and good eyesight.

Accomplishments

A thorough inspection was conducted in and around the remaining four Butte County infestations, including regular and postfumigation inspections. In Yolo County, final inspections were made of the City of Davis and the University of California Agricultural College at Davis. Postfumigation inspections are made on all fumigated properties.

Statement of crop losses

Hall scale has been eradicated from all known areas of infestation; therefore, no crop losses are being sustained by the growers.

Eradication or Control

Procedures or techniques used

None

Accomplishments

None

Regulatory

Procedures or techniques used

All quarantine restrictions were removed in April 1958.

Accomplishments

Not applicable

Methods Improvement

Work performed

All inspection techniques used on this program have been successfully employed during previous seasons and found effective. No innovations were tried during this period.

Accomplishments

Not applicable

Other

Cooperation received during fiscal year

The California Department of Agriculture furnishes seasonal help for fumigation, one-half of the inspection personnel, and part of the motor equipment used in field inspection.

Cooperative work needing strengthening another year

None

Associated activities and services

None

RECOMMENDATIONS FOR COMING YEAR

Survey

Complete the unfinished portion of the 1959 fiscal year's inspection. This will require the inspection of 22,000 Hall scale hosts in the Rath area and approximately 4,000 hosts in the outlying district of Paradise in Butte County.

Continue inspections on previously infested and peripheral properties as time and funds permit.

Eradication

None

Regulatory

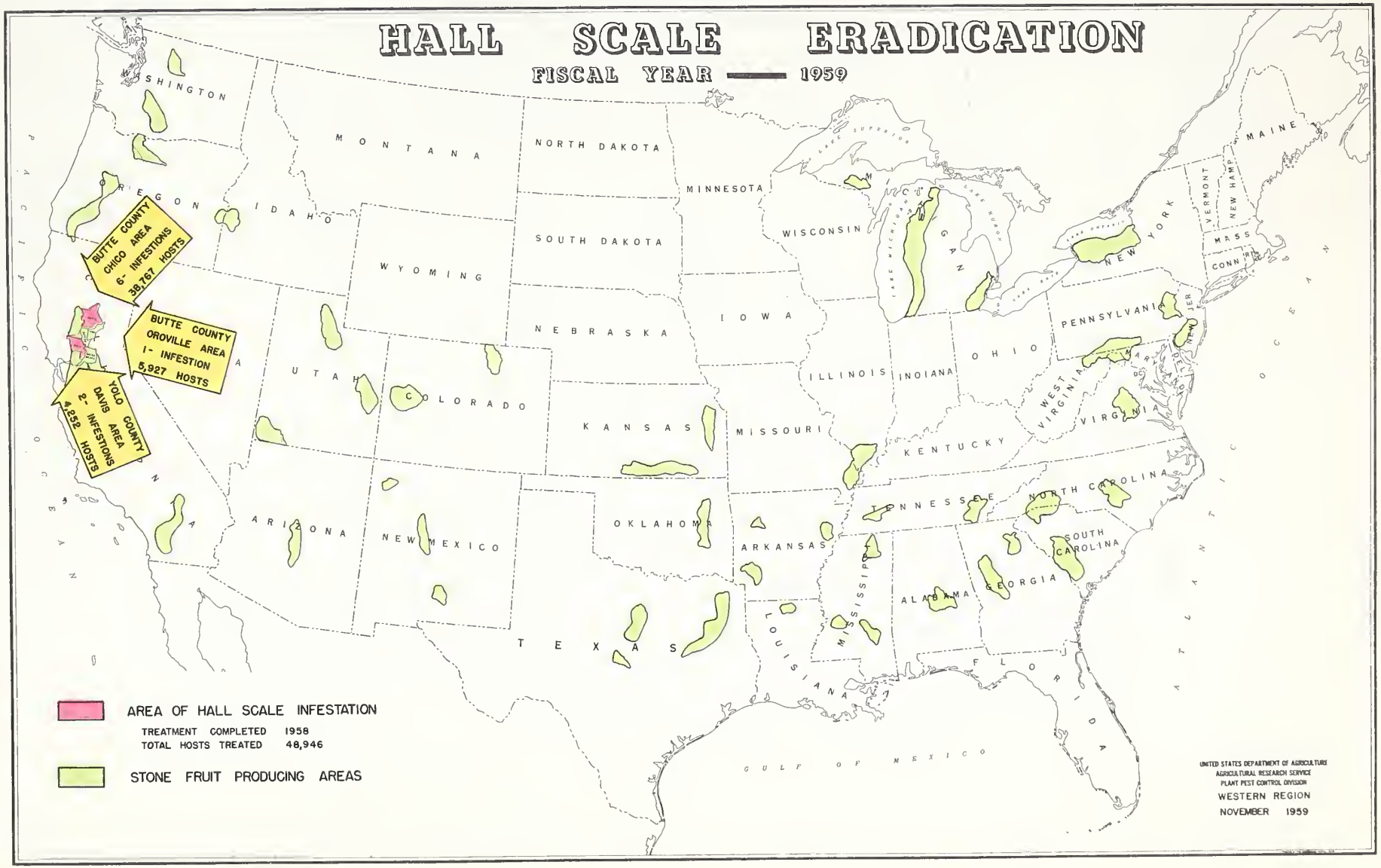
None

Methods Improvement

None

Other

None


HALL SCALE ERADICATION
FISCAL YEAR — 1959
BUTTE COUNTY CHICO AREA 6- INFESTIONS 38,767 HOSTS
BUTTE COUNTY OROVILLE AREA 1- INFESTION 5,927 HOSTS
YOLO COUNTY DAVIS AREA 2- INFESTIONS 4,252 HOSTS
AREA OF HALL SCALE INFESTATION
TREATMENT COMPLETED 1958
TOTAL HOSTS TREATED 48,946
STONE FRUIT PRODUCING AREAS
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
NOVEMBER 1959

GPO 979258

CONTROL OPERATIONS SUMMARY - FUMIGATION - HOST REMOVAL

HALL SCALE

State: California 1941 to June 30, 1959 Fiscal Year 1959

Treatment Area	Hosts on Infested Properties	Additional Hosts within Treatment Area	Total Hosts	Hosts Removed	Treatment Completed	Remaining to be Treated
Chico, Butte Co.						
U.S.P.I.G.	15,000		15,000		15,000	0
Bidwell Park	5,407	8,155	13,562	5,951	13,562	0
Johnson	3,600		3,600		3,600	0
Rath	500		500		500	0
Stilson Canyon	864	62	926	548	926	0
Chico City	6	5,173	5,179	3,741	5,179	0
Oroville, Butte Co.						
Oroville City	629	5,298	5,927	3,990	5,927	0
Davis, Yolo Co.						
Univ. of Calif.	2,800		2,800	2,800	2,800	0
Davis City #1	30	561	591	216	591	0
Davis City #2	75	786	861	538	861	0
Totals: (10)	28,911	20,035	48,946	17,784	48,946	0

INSPECTION OPERATIONS SUMMARY
HALL SCALE

State: California

Fiscal Year 1959

Area	City Blocks	No. Properties	Hosts Inspected	Hosts Infested
Infestation Area				
Bidwell Park	62	1,242	19,644	0
Davis Campus		1	1,639	0
Davis City	126	1,328	5,504	0
Johnson Area		60	9,793	0
Oroville City	14	172	777	0
Rath Area		64	19,518	0
Outlying Districts				
Butte Creek Area		7	54	0
Cohasset		21	168	0
De Sabla		5	22	0
Magalia		21	159	0
Nimshew		6	26	0
Paradise		242	10,123	0
Sterling City	9	74	271	0
Postfumigation				
Bidwell Park		29	1,698	0
Davis City (two inspections)	27	220	659	0
Oroville City	74	489	2,089	0
Totals	312	3,981	72,144	0
Cumulative totals since beginning of program	4,665	43,164	1,046,748	2,960 *

*Represents actual infested hosts.

6

EXPENDITURES BY SOURCE AND BY ACTIVITY

HALL SCALE

State: California

Fiscal Year 1959

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	5,000	-	57,900	-	-	-	-	62,900
Other Organizations (Name)								
States: Calif. Dept. Agri.	500	250	20,194					20,944
Subtotal-Other Organizations	500	250	20,194					20,944
Total (of PPC & Other)	5,500	250	78,094	0	0	0	0	83,844
Contributed Services**								
States:								
Counties:	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Grand Total	5,500	250	78,094	0	0	0	0	83,844

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available

COOPERATIVE AID RECEIVED

HALL SCALE

State: California

Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equiv.	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
California Dept. of Agriculture		20,944			20,944		20,944	
Total This Period		20,944			20,944		20,944	

*Total limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

HOJA BLANCA

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

The virus disease of rice, known as hoja blanca, which is transmitted by at least one leafhopper, (Sogata orizicola), was found on two farms in Hancock County, Mississippi. The infested fields and ponds were treated with malathion and after harvest the fields were fallowed, and volunteer rice in ponds and ditches was either herbicided or pulled out by hand. Chemical treatments and cultural control practices were continued on the three properties in Palm Beach County, Florida where the disease was found in 1957.

B. Major deviation from Work Plan

None

C. Status of Program at close of year

The fields and ponds on the two infested farms in Hancock County, Mississippi were practically free of rice plants at the end of the fiscal year.

In the Belle Glade area of Palm Beach County, Florida some volunteer rice was still present in the fields which had been found infested with the disease hoja blanca in 1957 since portions of the fields were still flooded to a depth of 2 or 3 feet. As soon as field conditions permit, chemical and cultural control practices will be resumed to destroy volunteer plants that may remain.

The only symptoms of hoja blanca noted in Florida during the year were in the previously infested plot at the Everglades Experiment Station in early January. Immediate steps were taken to plow this land, and a heavy cover crop of cane was sowed in order to shade the area to prevent volunteer rice growth.

II. Program Activity during fiscal year

A. Planning and direction

1. How planned and directed

Following the report of infestations in Mississippi, meetings were held with State Plant Board control and regulatory

personnel, as well as research and control personnel, of the U. S. Department of Agriculture. After a review of the problems, an eradication plan was agreed upon which was to be handled cooperatively by the State and Federal control agencies. Arrangements for continuing control practices in Florida were developed.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Rice growers were advised regarding cultural practices that could be followed to assist in eliminating the disease, which consisted of destroying volunteer rice in plowing and herbiciding.

2. Technical assistance provided to program by cooperating agencies

State and Federal research agencies cooperated with program personnel in outlining the cooperative eradication efforts and kept in close contact with the work during the course of the program in order to offer additional suggestions.

Valuable information and good cooperation was received from the Mississippi Rice Growers Association, the Mississippi State Plant Board and others interested in the production of rice along the Gulf Coast.

C. Survey

1. Procedures or techniques used

Initial surveys were made for the known insect vector, and when it was found, the next step was to make intensive inspections of rice plants for leaves showing yellowish-white discolorations ranging from mottling and streaking to complete etiolation.

2. Accomplishments

During fiscal year 1959, hoja blanca was discovered on two farms on the Gulf Coast in Hancock County, Mississippi. Sweepings at weekly intervals and light traps placed on the infested farms failed to reveal the presence of the insect during the calendar year 1959.

G. Other

1. Cooperation received during fiscal year

The one commercial grower in the infected area of Mississippi agreed to put his land in the soil bank and follow a procedure of clean cultivation, or fallowing. He cooperated fully in the application of insecticides and herbicides on the infected lands. The pond owner drained the ponds on his farm where rice had been planted for game birds. The pond areas were likewise treated with herbicides and insecticides.

2. Associated activities and services

A number of news releases were issued during the year to keep the public well informed regarding the presence of the disease in Hancock County and, particularly, to solicit cooperation in the eradication efforts, primarily through the nonplanting of rice.

III. Recommendations for the coming year

A. Survey

Vector surveys followed by intensive inspections when vector is found, should be continued in all rice growing areas of the South.

B. Eradication or Control

The program for the fiscal year 1960 should be a continuation of cultural practices, the application of herbicides and insecticides.

C. Regulatory

No State or Federal quarantine appears necessary at present.

D. Methods Improvement

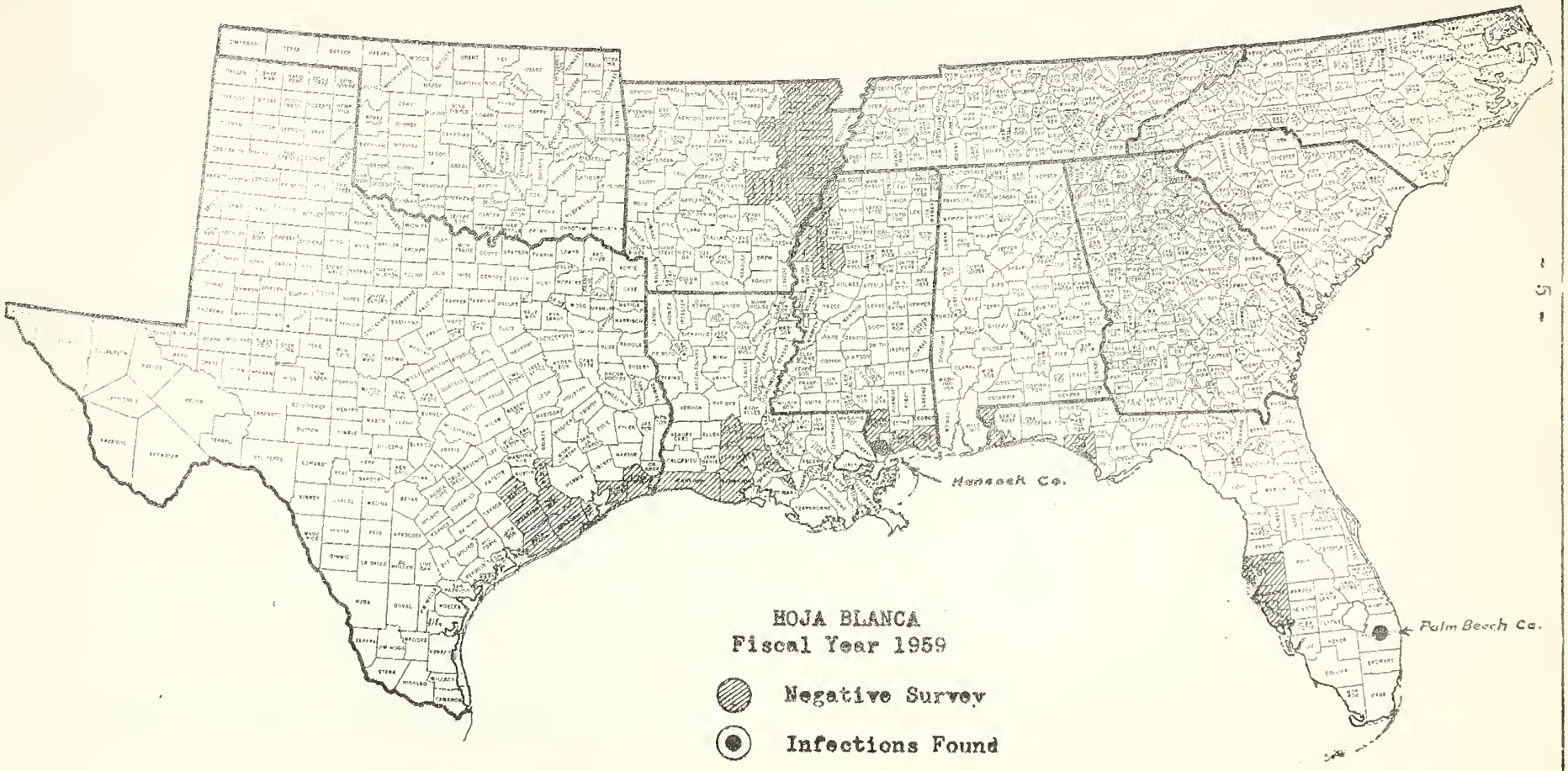
There is an urgent need for more effective vectorcides.

E. Associated Activities

Periodic news releases should be issued to keep the public informed regarding the status of the program and ways and means by which they may assist in obtaining the final goal of eradication.

SOUTHERN REGION

PLANT PEST CONTROL DIVISION



U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

HOJA BLANCA

Region: Southern | Prepared by:

Period (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1959 | Date prepared:

STATE COUNTY LOCALITY A	SURVEY		INFESTATIONS FOUND			CONTROL			
				Acres		Chemical		Cultural	
	Properties B	Acres C	Properties D	Cultivated E	Non-cultivated F	Properties G	Acres H	Properties I	Acres J
Arkansas	132	5,515	0	0	0	0	0	0	0
Florida	81	2,908	0	0	0	3	702	3	1,118
Louisiana	76	11,600	0	0	0	0	0	0	0
Mississippi	433	12,371	2	70	15	2	907	1	328
Texas	75	7,685	0	0	0	0	0	0	0
Total This Period									
Total From July 1	797	40,079	2	70	15	5	1,609	4	1,446
Total From Beginning of Program	823	41,805	5	381	15	5	4,559	4	1,820

Report: Total counties by States infested from beginning of program

PPC Form 7-23
Feb 1959

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Hoja Blanca

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: _____

Region Southern

Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
Florida	-	-	-	-	-	-	34	-	1			
Georgia	-	-	-	-	1	-	-	-	-			
Texas	-	-	-	-	-	-	4	-	-			
Total	-	-	-	-	1	-	38	-	1	-	-	-

- - -

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

IMPORTED FIRE ANT

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

December 2, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Imported fire ant activities were considerably increased during the 1959 fiscal year. State and local County Fire Ant Committees were very active in support of this program.

Surveys were conducted in all of the 11 states in the Southern Region, and infestations were found in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. Infestations were found for the first time in 24 counties. Eradication treatment was made to 931,981 acres during the year for a grand total of 1,381,534 acres since the program began.

B. Major deviation from work plan

In practically all of the states, the original work plan was followed. However, in the state of Alabama, the program was changed to one of farmer-participation, i.e., the farmers were allowed to either apply the insecticide with available equipment or pay for having it applied as their share of the program. The federal and state governments accepted the responsibility of eliminating the fire ant from nonproducing land. In all states the dosage of heptachlor per acre was reduced from 20 pounds to 12-1/2 pounds.

C. Status of program at close of year

All known infestations in North Carolina and South Carolina had been completely treated at the close of the period. Considerable progress was made in the application of eradication treatments in most of the counties in the infested states.

At the end of the year, 262 counties and parishes in the Southern Region had been found infested.

II. Program activity during fiscal year

A. Planning and direction

1. How planned and directed

The Imported Fire Ant Program is a cooperative undertaking between the federal and state governments and local participants. State Fire Ant Committees were organized in some states to assist in planning and developing state programs. After plans were approved, the program was carried out under the direction of the Plant Pest Control Supervisors in charge of each state.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel

Growers and nurserymen were informed of the hazards of spread of this insect through personal contacts and talks at meetings by state and federal personnel, and by the use of visual aids (color slides and movies), exhibits, and actual field demonstrations. All eradication and regulatory treatments were directly supervised by authorized state and federal personnel. Program personnel furnished technical assistance to nurserymen and others affected by the quarantine in treating their establishments so that quarantine requirements could be met.

The Methods Improvement Section of Agricultural Research Service provided technicians to assist in the checking and calibrating of aircraft used by contracting firms to be sure that contract specifications were being met.

2. Technical assistance provided to program by cooperating agencies

Technical assistance was provided to the program by State Extension Services through their county agents and entomologists, and by State Farm Bureaus and State Departments of Agriculture. The U. S. Soil Conservation Service, Forest Service, and Agricultural Stabilization and Conservation also provided technical assistance to the program. State and local fire ant committees aided by dispersing information concerning the fire ant through newspapers, radio, television, color slides, and personal contact. The Farm Bureaus in some states conducted surveys for a consensus of opinion as to the value and results of the program.

C. Survey

1. Procedures or techniques used

a. Field

Three types of surveys were made: (1) detection surveys of areas not known to be infested, (2) delimiting surveys of infested areas, and (3) surveys to determine the effectiveness of treatment. Detection surveys were conducted in the late winter and early spring, and delimiting surveys were continually in progress in infested counties to determine the extent and intensity of infestations. Surveys of treated areas were made after sufficient time had elapsed for treatment to be effective. Detection surveys covered nurseries and sites along highways, county roads, railroad rights-of-way, pipeline and electric

transmission lines. Field personnel collected and submitted ant specimens to the laboratory for identification.

b. Laboratory

Microscopic examinations of specimens submitted by field personnel were made for species determination at Gulfport. Confirmation of positive finds in new counties was made in Washington.

2. Accomplishments

A total of 21,288,367 acres in 262 counties and parishes of 9 states was known to be infested with the imported fire ant at the close of the fiscal year.

3. Statement or table of pest damage

Reports were received from farmers that the fire ant seriously damaged certain crops such as corn, okra, cabbage, Irish potatoes, peas, beans, and other truck and field crops. Cattlemen have complained of losing newborn calves as a result of the ants, and reports have been received that some individuals stung by the ants have required medical treatment. Farmers in areas where the fire ant has been eliminated state that for the first time in many years they have been able to return to their farming operations without loss of crops and damage to machinery.

D. Eradication or control

1. Procedures or technques used

Granular insecticides were applied by hand and ground equipment and by aircraft applications. Ten percent technical heptachlor was used at the rate of 30 pounds per acre on nurseries and similar properties, and 20 pounds per acre on other infested areas. However, in May 1959, on the basis of research developments, the heptachlor dosage was reduced from 20 pounds to 12-1/2 pounds per acre, provided the equipment could be modified to apply that amount of insecticide evenly. Acreage infested with both the imported fire ant and white-fringed beetle was treated with 10 percent granular dieldrin at the rate of 30 pounds per acre.

2. Accomplishments

During the year, 931,981 acres received insecticide treatments--563,414 by aircraft; 340,828 by hand or ground equipment; and 27,739 by farmers. This brings the total acreage treated from the beginning of the program to 1,381,534.

Of the 262 counties and parishes known to be infested at the close of the period, treatment had been completed in 73, treatment was in progress in 78, and 98 were under treatment primarily for regulatory purposes. Only 13 counties had not received any treatment.

E. Regulatory

1. Procedures or techniques used

Regulatory operations in infested states were conducted according to instructions contained in federal and state quarantines. As additional counties were found infested, they were placed under federal and state quarantines. Under these quarantines, products determined to present hazards in the spread of imported fire ants were made eligible for certification through the application of approved insecticides, fumigants, etc.

2. Accomplishments

Extensive certification treatments were applied in most of the infested states. All of these treatments were accomplished without difficulty and no legal action was necessary.

F. Methods Improvement

1. Work performed

a. The analytical program, in connection with checking materials for compliance with specifications, has proven highly effective. This work is continuing.

b. Study of granular additives is continuing with the hope of obtaining satisfactory material or materials for stabilizing the insecticide residue in the soil in order to obtain maximum effectiveness with minimum undesirable side effects, such as forage contamination.

c. Soil residues following application are being studied with the hope of more nearly determining ideal conditions for application.

d. New formulations of granules on various clays are being studied in the hope of obtaining an insecticide formulation which will be more effective and at the same time more economical.

e. Studies were continued on evaluating various dosages of heptachlor and dieldrin applied at monthly intervals.

f. The effectiveness of two applications of heptachlor at low dosages was studied.

g. Evaluating various granular additives for extending heptachlor soil residues and increasing soil residue from low dosage applications.

h. Evaluating various granules other than attapulgite.

i. Studies on effectiveness of chlordane, aldrin, Kepone, and Sevin.

j. Tests with various baits and toxicants on field plots.

k. Determination of the acceptance of some foods by the imported fire ant in the field and laboratory.

l. Evaluating numerous insecticides as bait toxicants.

m. Development of new methods and procedures for laboratory tests.

2. Accomplishments

Samples from over 15,611,000 pounds of granular insecticides were analyzed. Approximately 10 percent of the material analyzed in the first six months was substandard. This fell to 3.7 percent during the next six months when 357,300 pounds were found substandard when samples were analyzed from 9,755,400 pounds of granular insecticides. Of this rejected material, 12,000 pounds analyzed less than 0.5 percent when it should have analyzed 10 percent, pointing out the necessity of continued examination of every batch.

Several additives have been found which show promise in stabilizing the heptachlor so that it is lost less rapidly following granular application. The most promising is a heavy aromatic solvent which is a by-product of petroleum refining. This material shows promise of not only increasing the effectiveness of the formulation, but also of decreasing the cost per pound. Studies in connection with finding a suitable water repellent were only partly successful. It is possible now to make a water repellent granule, but even this still yields an undesirable forage residue.

Bentonite and Pike's Peak clay have been formulated into insecticide granules and applied to test plots. It is hoped that these cheaper clays may help lower the cost of the formulation; however, it is still too early to evaluate these tests.

Observations on plots treated at monthly intervals with 1 or 2 pounds of heptachlor or dieldrin per acre have shown the following:

(1) There is little difference in the number of plots showing complete kill at some time during the count periods.

(2) Insufficient time has elapsed to draw definite conclusions about the length of residual; however, in one instance one plot treated with 1 pound of heptachlor and another with 2 pounds of heptachlor have been heavily reinfested after one year.

(3) Heptachlor kills faster than dieldrin.

(4) Higher dosages kill faster than lower dosages.

(5) Little difference in kill was attributable to the time of year applied.

(6) Rain and warm temperatures are essential for fast kill.

(7) Lack of rainfall after treatment during hot weather may result in a shortening of the residual to be expected from heptachlor.

Two applications of either 1/2- or 1/4 pounds per acre of heptachlor at intervals of from 3 to 6 months have given complete control of imported fire ants. Studies with chlordane and aldrin indicate the need for further tests with these insecticides, particularly for repeated low dosage applications.

An efficient method for evaluating the acceptance of foods in the field by imported fire ants has been developed, as well as laboratory methods for screening a large number of different foods, food additives, and bait toxicants. Seventy-nine chemicals have been given preliminary screening as bait toxicants. Vegetable and animal oils have been the best foods found thus far. As many as 123 compounds have been tested as additives to peanut oil for increasing its attractivenesss. Field tests with poison baits have shown Kepone to be a better toxicant than heptachlor.

C. Other

1. Cooperation received during fiscal year

a. List major contributions received and show importance to program (other than funds)

The State Plant Pest Control agencies helped in planning, executing, and financing the program. The Extension Service, through its entomologists and county agents, continued to cooperate in the educational phases of the work by preparing and distributing bulletins, and furnishing other program information to the public by radio, newspapers, television, and talks at meetings. Cooperation was also extended in

some states by the State Board of Health, State Experiment Stations, and the Farm Bureau. Colleges and Universities of the several states, military bases, State Highway Departments, U. S. Department of Interior, U. S. Forest Service, officials of many counties and municipalities, and individuals also cooperated with Division personnel on this program. The U. S. Public Health Service and various branches of the U. S. Department of Interior again assisted in conducting studies and providing information on ways to lessen hazards of insecticide application.

b. Cooperative work needing strengthening another year

The cooperation received in most states was very satisfactory; however, there is a need for appropriated funds in some states, and in some instances the relations with other agricultural agencies need strengthening.

2. Associated activities and services

To encourage local participation in the Imported Fire Ant Program, the following activities played an important part: (1) attendance at public meetings; (2) presentation of talks, color slides, films; (3) appearance on radio and television, (4) feature and news stories; (5) presentation of exhibits; (6) distribution of bulletins, circulars, maps, and posters; and (7) preparation of special reports.

III. Recommendations for coming year

A. Survey

Surveys should be continued to locate any new infestations or extensions to known infestations that may have developed, and to evaluate results of eradication treatments and treatments for regulatory purposes. Peripheral areas of treated infestations should be carefully inspected to make certain no incipient infestations remain.

B. Eradication or control

Recommendations are to continue present methods pending development of more effective and less expensive procedures. Where possible, fire ant treatments will continue to be combined with white-fringed beetle treatments.

C. Regulatory

Particular attention should continue to be given to treatment of nurseries, farmers' markets, areas around truck and rail depots, etc., to prevent long-range dissemination.

D. Methods Improvement

(1) Continue the work presently underway.

(2) Study new combinations of bait and residual treatments for fire ant eradication.

(3) Set up large-scale field treatment studies of the more promising insecticide additive treatments.

(4) Study application methods from efficiency and precision standpoints. Much insecticide is wasted by inefficient application. Learning the extent of this problem will materially help in its solution.

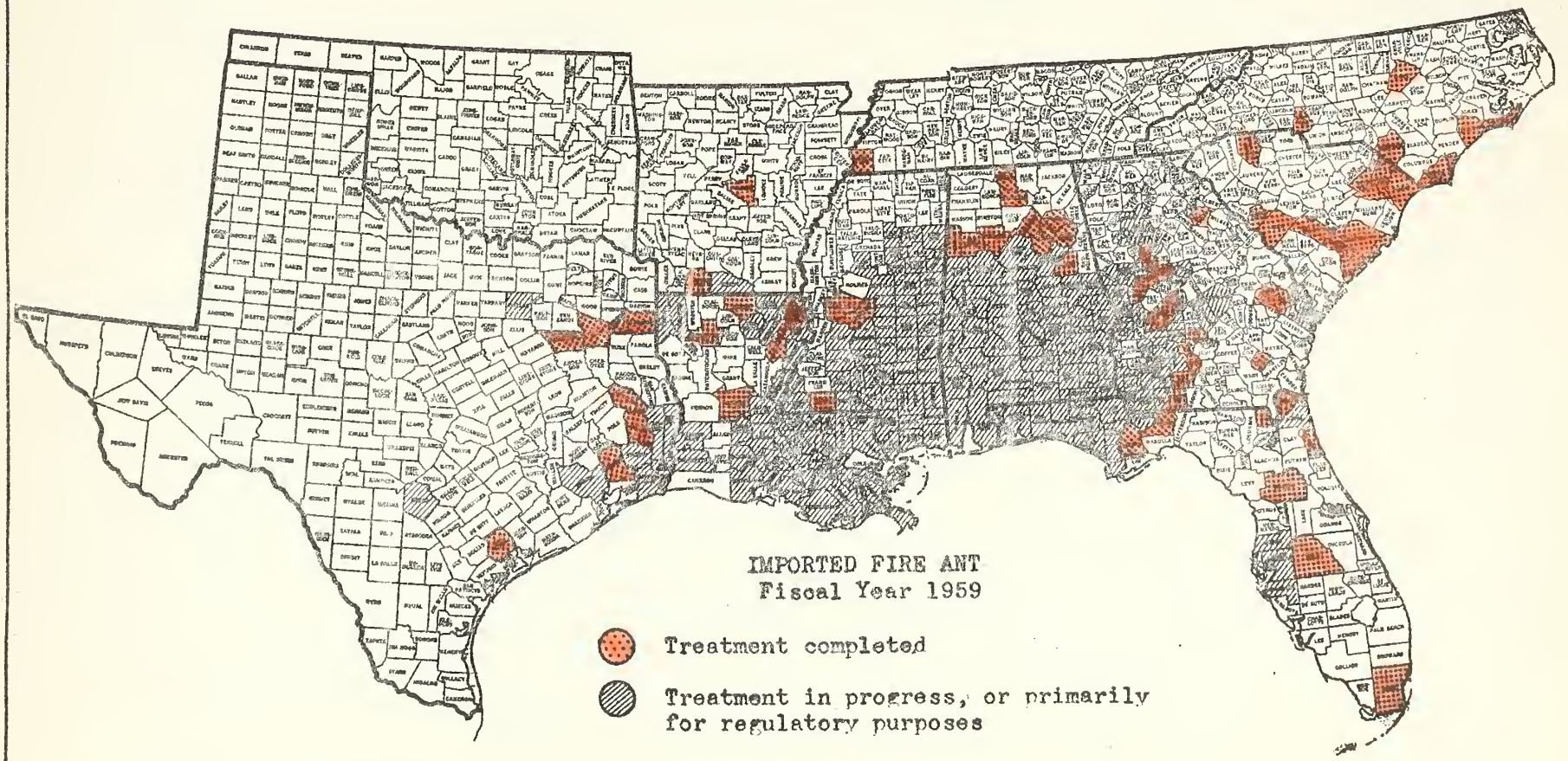
(5) Set up a study to determine the rate of natural spread of the imported fire ant.

(6) Make preliminary studies on the effectiveness of a sex sterilant combined with a bait for eradication of the imported fire ant.

E. Associated activities

Publicity and educational work should be maintained as it is at present, and increased wherever possible.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE - PLANT PEST CONTROL DIVISION
SOUTHERN REGION



Agriculture - Dodge Printing Co. Gulfport, Miss.

IMPORTED FIRE ANT

REGION: Southern

PREPARED BY:

PERIOD *(Designate: Month, 1-15, 16-31, or 1-31)*: Fiscal Year 1959

STATE COUNTY LOCALITY	COOPERATIVE ERADICATION PROGRAM		BY FARMERS EXCLUSIVE OF COOP PROGRAM	TOTAL ACRES TREATED*	ESTIMATE OF ACRES REMAINING TO BE TREATED
	BY AIRCRAFT	OTHER			
Alabama	85,508	125,285	10,465	221,258	10,944,883
Arkansas	24,364	140	0	24,504	275
Florida	86,182	96,547	399	183,128	1,068,250
Georgia	157,669	12,833	65	170,567	116,342
Louisiana	201,178	30,106	7,989	239,273	4,165,157
Mississippi	1,052	53,094	5,905	60,051	4,208,796
N. Carolina	0	549	0	549	0
S. Carolina	1,060	4,011	0	5,071	0
Texas	6,401	18,263	2,916	27,580	784,664
TOTAL THIS PERIOD					
TOTAL FROM JULY 1	563,414	340,828	27,739	931,981	21,288,367
TOTAL FROM BEGINNING OF PROGRAM	826,948	408,495	146,091	1,381,534	XXX

*COLUMNS C, D, AND E, INCLUSIVE.

PPC 7-22
(JULY 58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Imported Fire Ant — SUMMARY OF ASSOCIATED ACTIVITIES — Prepared by: _____

Region Southern — Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
Alabama	190	164	22	42	0	9	33	20	7,381	7,305	20	1
Arkansas	12	12	2	12	6	2	0	0	0	0	0	0
Florida	44	31	20	2	4	5	702	6	3,530	12,145	20	1
Georgia	35	21	14	3	18	7	37	3	2,000	2,000	42	-
Louisiana	46	22	5	4	6	1	36	0	210	150	6	12
Tennessee	-	-	-	-	-	-	-	-	-	10	-	-
Texas	47	61	50	10	4	3	16	4	130	687	37	1
Total	374	311	113	73	38	27	824	33	13,251	22,297	125	15

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE CONTROL

July 1, 1958 - June 30, 1959

In Cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

Trapping for Japanese beetle was performed in all States of the Central Region during fiscal year 1959. The number of traps varied from 40 in Nebraska to 9,175 in Michigan. During the peak period of trapping, 30,327 traps were operated in the Region. Exclusive of treatment in nurseries, 19,704 acres were soil-treated and an estimated 998 acres were foliage-sprayed. In the regulated area of the Region, consisting of a portion of Ohio, Plant Pest Control personnel made 3,924 service calls to some 223 shippers for certification purposes under Quarantine No. 48. The Federal quarantine in Ohio was extended in seven counties along the western border of the regulated area and one township in Lucas County.

B. Major deviation from work plans

Aims and goals of the work plans were generally met during the fiscal year.

C. Status of program at close of year

No infestations are known to exist in the States of Kansas, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin. In Iowa and Michigan, all known infestations had been soil-treated by the end of the fiscal year. Missouri infestations are restricted to a few local areas involving a limited acreage in St. Louis.

Infestations in Illinois totaled some 45,000 acres in Sheldon, Chicago and vicinity, Kankakee, Streater, Joliet, and East Peoria. In Indiana, extensive infestations exist at Fort Wayne, South Bend-Mishawaka-Elkhart area, Gary-Hammond-East Chicago area, Logansport, Kentland, Indianapolis, Terre Haute, with small infestations at Richmond, Plymouth, Argos, Wanatah, and Garrett. Beetles were found for the first time in Goshen, Huntington, Osceola, Frankfort, Lafayette, West Lafayette, and Greenfield. In Kentucky and Ohio, the infestation picture is essentially the same as at the close of fiscal year 1958, except the Cincinnati infestation is extending southward into Kentucky and surrounding counties of Ohio. The immediate counties affected in Kentucky are Boone, Campbell, and Kenton.

II. PROGRAM ACTIVITIES DURING FISCAL YEAR

A. Planning and direction

The program for the year was planned and directed by Division and cooperating personnel. The State Supervisors in Charge worked very closely with State officials in all phases of the program. The enforcement of Federal Japanese Beetle Quarantine No. 48 was primarily a Division responsibility.

B. Technical assistance

Appropriate Division and State Department of Agriculture and/or Conservation officials provided technical assistance. Golf associations, community groups, and others were informed as to how, when, where, and why control was desirable on a local or community basis. Printed matter and visual aid material was distributed to interested groups and individuals by Extension Service workers. Experiment Station officials and Agricultural Research Service workers provided information to program officials concerning the ecology and control of the beetle, regulatory requirements, and toxicity of the insecticides.

C. Survey

The extensive use of baited traps was the principal method of survey. Limited visual scouting was also performed. All survey activities were designed to find new infestations or delimit known infested areas, thus enabling adequate control action to be taken.

Limited inspections of aircraft, railroad cars, and motor vehicles were made at Chicago, Illinois, Cincinnati, Ohio, and St. Louis, Missouri, in an attempt to determine if these conveyances were potential carriers of the Japanese beetle.

D. Eradication or control

Foliage treatment, using a DDT solution at the rate of one pound of insecticide per gallon of mixture per acre, was applied on 998 acres, 868 of which were in Ohio and 130 in Indiana.

Of the 19,704 infested acres, soil-treated with granular 10-percent heptachlor or dieldrin in Iowa, Missouri, Illinois, Indiana, Michigan, Kentucky, and Ohio, 15,197 were by commercial and State-owned aircraft. The areas involved were East St. Louis and Blue Island, South Chicago, Illinois, 13,065 acres; and Pike County, Kentucky, 2,132 acres. Ground application was accomplished by Turbine blowers, Skibbe spreaders, and hand-operated casters and seeders.

An unknown number of infested acres was also treated by individuals, clubs, and similar groups plagued with this insect.

E. Regulatory

The regulated area in the Central Region is confined to a territory consisting of approximately the eastern one-third of Ohio and three small areas in as many counties detached from the main area. During the year, 3,924 service calls were made by our inspectors. The estimated value of the 167,485,829 plants certified amounted

to $9,353,398.00. All costs of the certification work, exclusive of the inspection service, were assumed by the individual establishments.

In non-regulated areas, where beetles have been found in or adjacent to establishments, movement of stock is restricted by agreement between the grower and the State Department of Agriculture. Such an agreement is promulgated in the Cincinnati, Ohio, area. The enforcement of regulations set forth in this agreement is the responsibility of the State. In Illinois and Indiana, restricted movement of products is governed by State quarantine regulations and enforcement is the State's responsibility.

F. Methods improvement

Method improvement in survey procedure, certification treatments, and inspection under regulation and control know-how is a continuing process. This year special attention was given to the trapping pattern used in delimiting areas known to be infested, as compared to trapping on an exploratory basis. Consideration was also given to the frequency traps should be supplied with bait during the season. The Regional Office for the first time purchased the attractant mixed and bottled. In the field of treatment for certification purposes, our inspectors are constantly alert to changes that may increase the efficiency of all regulatory activities. Methods of control were likewise studied with the aim of reducing cost and increasing accuracy of application, providing greater safety in operations and further reducing the hazards of the insecticide to forms of life other than the insect involved.

The ideas considered worthy of attention were given to our Methods Improvement Operations, Beltsville, Maryland.

G. Other

Extensive use was made of program aids, including bulletins and circulars, in acquainting the public concerned with the programs in the various States. Some news articles were released. When opportunity permitted, the program was explained at meetings and other public gatherings. Limited publicity was also released on radio and on TV.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

Further thought and study should be given to ways of reducing the cost of actual trapping operations. Items under consideration include trap losses, frequency of checking traps, and the trapping pattern for delimiting and exploratory purposes.

B. Eradication or control

In lieu of a cheaper or more efficient approved method of stopping the western movement of the Japanese beetle, we recommend the Division continue to support and financially assist states interested in the progressive eradication of this insect.

We recommend that further consideration be given to soil treating the heart or core of large infestations outside the regulated areas when it is determined that these areas are hazardous from the standpoint of the spread of the beetle.

During this past year, several cooperators have indicated that possibly our over-all approach to Japanese beetle problems should be reviewed, now that Division action in 1958, and again this year, has clearly brought into focus the immensity of the problem. We recommend that appropriate steps be taken to establish a nationwide control policy.

C. Regulatory

Summer quarantine measures should be continued the same next year in areas where beetle populations are hazardous.

The industry should be further encouraged to apply certification treatments to all items under regulation during the summer months. This would lessen the need for the more costly and difficult requirement of fumigation.

Treatment requirement for certification should continue to be kept current by adding new insecticides to the approved list as their effectiveness is determined by Federal and State research workers.

Continue to stress the importance of good public relations and cooperation among and between inspector and the nursery. Industry should be kept conscious of all regulatory activities.

D. Methods improvement

Method improvement operations are determining the effectiveness of 20-percent granular insecticide for Japanese beetle control. If the higher concentration is found to be equal or superior to 10-percent material, considerable application savings would result, as the per-acre rate would be reduced by 50 percent.

All State and Federal personnel should be encouraged to make suggestions for improving procedures in all phases of Japanese beetle work.

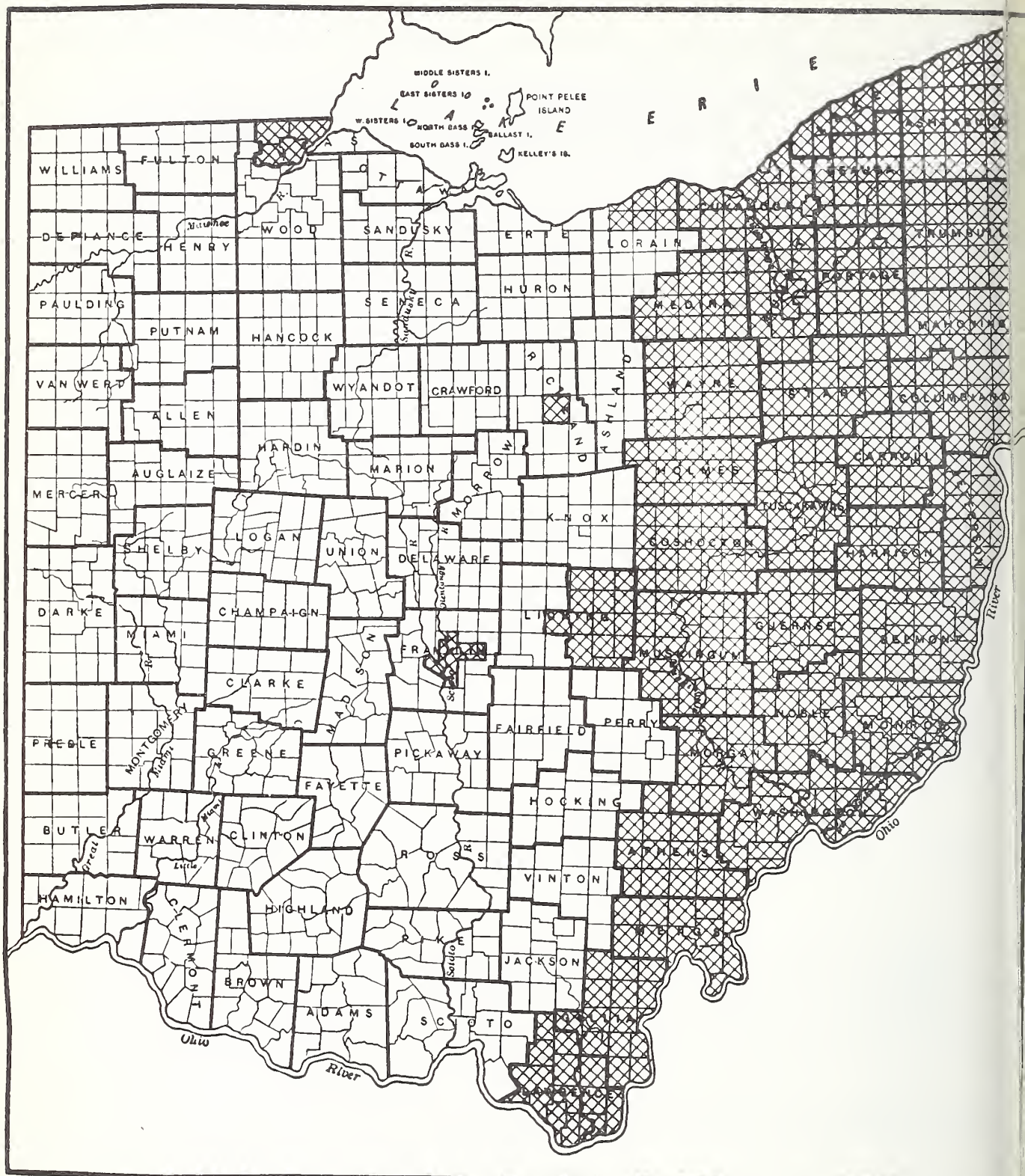
Research workers should be encouraged in their efforts to develop a way by which milky disease can be economically used for the control of Japanese beetle on a larger scale.

E. Associated activities

The Japanese beetle story should be told by posters, visual aids, films, etc. Appropriate talks should be made at every opportunity. The press should be provided with timely information relative to the problem.

OHIO

Japanese Beetle Regulated Area



Japanese Beetle - Accomplishments, Fiscal Year 1959

State	Survey			Control (Acres)	
	Traps in Use	Visually Scouted	Acres of New Infestations Outside Regulated Area	Soil	Foliage
Illinois	6,172	0	68,337	14,136	0
Indiana	4,197	3	117,357	276	130
Iowa	1,000	22	10	48	0
Kansas	70	18	0	0	0
Kentucky	1,675	97	643	2,218	0
Michigan	9,175	37	0	254	0
Minnesota	262	0	0	0	0
Missouri	2,386	26	50	237	0
Nebraska	40	14	0	0	0
Ohio	4,740	1,229	248	2,535	868
Wisconsin	610	2	0	0	0
Totals	30,327	1,448	186,645	19,704	998

The following data on "Certification Services pertain to Ohio only:

Shippers Serviced	223
Total Service Calls	3,924
Estimated Value Products Certified	$9,353,398
Plots (Acres)	965
Bulk Soil (Cu. Yds.)	5,068
No. of Plants	167,485,829

Japanese Beetle - Summary of Associated Activities - Fiscal Year 1959

State	Public Meetings Attended	Presentations: Talks	Slides	Films	Radio	TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bul.*	Cir.*	Infes. Maps & Posters	Other
FEDERAL												
Illinois	1	0	0	0	0	0	0	0	200	0	23	0
Indiana	0	0	0	0	0	0	0	0	204	0	0	1,000***
Iowa	0	0	1	1	0	0	0	0	0	800	0	0
Kentucky	2	1	3	1	1	0	0	0	255	0	75	0
Michigan	0	6	0	11	0	0	0	0	134	0	80	640****
Minnesota	0	0	14	0	0	0	0	0	25	0	0	0
Missouri	0	0	0	0	0	0	0	0	0	2,200	0	0
North Dakota	1	0	0	0	0	0	0	0	0	50	0	0
Ohio	2	1	1	4	0	0	0	0	1,750	875	2,784	130****
South Dakota	1	0	0	0	0	0	0	0	0	50	0	0
Wisconsin	0	0	0	0	0	0	0	0	50	50	35	0
Subtotals	7	8	19	17	1	0	0	0	2,618	4,025	2,997	1,770
COOPERATORS												
Illinois	0	0	0	0	0	0	2	1	30,574	0	216	15,603
Indiana	0	0	0	0	0	0	0	0	0	0	400	60
Kentucky	1	1	3	0	0	0	0	0	255	0	75	0
Michigan	0	13	0	2	3	0	0	0	0	0	320	0
Minnesota	0	0	0	1	0	0	0	0	0	0	0	0
Missouri	0	0	0	0	1	0	0	0	0	200	0	0
North Dakota	1	1	1	0	0	0	0	0	0	0	0	0
Ohio	2	0	0	4	0	0	0	0	1,750	875	2,784	1
South Dakota	1	1	1	0	0	0	0	0	0	0	0	0
Subtotals	5	16	5	7	4	0	2	1	32,579	1,075	3,795	15,664
GRAND TOTALS	12	24	24	24	5	0	2	1	35,197	5,100	6,792	17,434

*Written by Federal personnel for release direct or through cooperators. **Conservative estimate.
***Re-run of notice page. ****Annual news letters (repeated in all Project Reports).

Japanese Beetle - Expenditure by Source and by Activity, Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	$11,000	$ 5,900	$ 84,500	$ 40,500	$31,500	$1,100	$1,100	$175,600
Other Organizations:								
Illinois	0	0	6,600	51,900	0	0	500	59,000
Indiana	0	0	5,500	6,200	0	0	1,000	12,700
Iowa	0	0	600	400	0	0	0	1,000
Kentucky	500	0	1,000	8,500	0	0	200	10,200
Michigan	1,600	1,000	11,400	3,300	0	0	0	17,300
Minnesota	0	0	400	0	0	0	0	400
Missouri	0	0	2,800	1,400	0	0	200	4,400
Ohio	2,000	0	11,000	21,000	12,700	0	5,900	52,600
Wisconsin	0	0	0	0	0	0	100	100
Subtotals	$ 4,100	$ 1,000	$ 39,300	$ 92,700	$ 12,700	0	$ 7,900	$157,700
CONTRIBUTED SERVICES**								
Illinois	1,800	2,100	0	0	500	0	0	4,400
Indiana	1,000	2,000	0	0	0	0	0	3,000
Iowa	200	400	0	0	0	0	0	600
Kansas	0	0	600	0	0	0	0	600
Kentucky	0	3,100	2,500	1,000	0	0	1,000	7,600
Michigan	0	0	5,000	0	1,000	0	0	6,000
Minnesota	0	200	2,000	0	0	0	0	2,200
Missouri	200	500	0	0	400	0	0	1,100
Nebraska	0	0	300	0	0	0	0	300
North Dakota	0	0	100	0	0	0	0	100
Ohio	2,000	12,000	3,000	0	2,500	0	0	19,500
South Dakota	0	0	100	0	0	0	0	100
Wisconsin	100	900	400	0	500	0	0	1,900
Subtotals	$ 5,300	$21,200	$ 14,000	$ 1,000	$ 4,900	$ 0	$1,000	$ 47,400
GRAND TOTALS	$20,400	$28,100	$137,800	$134,200	$49,100	$1,100	$10,000	$380,700

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is a definite replacement value.

**Services incidental to other activities - only estimated value available.

Japanese Beetle - Cooperative Aid Received, Fiscal Year 1959

State	Cash or Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 56,500	$ 0	$ 2,000	$ 500	$ 59,000	$ 4,400	$ 63,400
Indiana	10,900	0	800	1,000	12,700	3,000	15,700
Iowa	0	500	500	0	1,000	600	1,600
Kansas	0	0	0	0	0	600	600
Kentucky	10,000	0	0	200	10,200	7,600	17,800
Michigan	13,500	3,600	0	200	17,300	6,000	23,300
Minnesota	400	0	0	0	400	2,200	2,600
Missouri	0	3,500	700	200	4,400	1,100	5,500
Nebraska	0	0	0	0	0	300	300
North Dakota	0	0	0	0	0	100	100
Ohio	0	25,100	24,600	2,900	52,600	19,500	72,100
South Dakota	0	0	0	0	0	100	100
Wisconsin	0	0	0	100	100	1,900	2,000
Totals	$91,300	$32,700	$28,600	$5,100	$157,700	$47,400	$205,100

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

(*__*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE

July 1, 1958 - June 30, 1959

COOPERATING AGENCIES

State Plant Pest Control Agencies
Experiment Stations, Extension Service
and
Plant Pest Control Division, Entomology Research Division
of the
Agricultural Research Service
U. S. Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of this year's program activity

A. Accomplishments for the fiscal year

Cooperative survey was continued in nonregulated sections of the six partially regulated states at about the same level as the previous year, and control treatments were applied at isolated infestations. There was further extension of regulated area in Vermont, Virginia, and West Virginia.

Seasonal regulatory inspections and foliar treatments as necessary were made throughout the regulated area at commercial and military airports, truck loading, and other sites from which long distance spread was a matter of concern. Aerosol treatment of aircraft interiors was necessary at only a limited number of airfields.

Inspection and certification services were provided throughout the year to growers and shippers of regulated articles. Products having a total estimated value of nearly eleven million dollars were certified for movement from regulated areas.

B. Major deviation from work plan

None

C. Status of program at close of year

Except for additional beetle finds in nonregulated sections of Vermont, Virginia, and West Virginia which necessitated expansion of the regulated area in these states, there was no substantial change in beetle population or distribution from the previous year. Surveys in New York continued to show light infestation distributed in nonregulated sections of the western part of the state. Infestations were heavy at scattered locations throughout the regulated area but, in general, beetle populations were not as severe as in former years.

Certification of soil and plant products for movement from regulated areas is the major program activity in this region. In 1958, summer seasonal quarantine requirements were changed considerably, emphasis being placed on the most hazardous possibilities of spread.

II. Program activity during fiscal year

A. Planning and direction

General planning and direction was by the States concerned and Division State Supervisors. Research associates were important participants in planning.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel

Regulated industry was advised as to ways and means of certifying products for movement from regulated areas. This included instructions on the various certification treatments, growing, and processing methods, and the use of approved insecticides. Program personnel also advised community groups and private individuals participating in local control treatments.

2. Technical assistance provided to program by cooperating agencies

Technical assistance in all phases of the program was provided by several units of the Entomology Research Division and State Experiment Station associates. This included assistance in insect identification, soil analyses, and the development and improvement of regulatory treatments. Also, assistance in preparation of quarantine maps, shippers' guides, and treatment manuals.

C. Survey

1. Procedures or techniques used

a. Field

In the nonregulated parts of the region, standard Japanese beetle scouting traps were used to detect and delimit infestations. The trapping program was supplemented by visual observations at selected locations, including commercial plant growing establishments and environs.

Within the regulated area scouting was conducted by the regular inspection force to determine distribution and abundance of adult beetles and related spread hazards for regulatory purposes.

b. Laboratory

Not applicable

2. Accomplishments

During July and August, a total of 1,876 traps were in use (see Table I, Col. H). Recorded observations were made at more than 3,000 localities. In Maine, 596 traps were set in 52 towns outside the regulated area. Beetles were

recovered in two towns, as well as in Waterville, an isolated regulated city, where traps were used to delimit infestations for control purposes. In Gardiner, where several were found the previous year, 32 adults were trapped. A first record find was recorded in Lisbon Falls with the finding of one specimen. Scouting in 15 towns in nonregulated sections of New Hampshire, where no traps were used this year, resulted in finding one beetle in Woodsville. One hundred traps used to delimit known infestations in Barre and Montpelier, Vermont, collected 57 and 42 beetles, respectively. In New York State, 720 traps were placed in 36 communities in seven counties west of the regulated area. Trap catches totalling 145 beetles were made in 19 localities. In 16 of these, catches ranged from one to six beetles. In the other three localities, 18 beetles were trapped at Victor; 40 at Sodus Point, and 57 at Wolcott. Scouting and traps were utilized in Virginia to delimit infestations in 18 nonregulated counties placed under regulation in May, 1959. In addition, the infestation in the City of Bristol was delimited and findings provided a guide for control treatments applied in April, 1959. In West Virginia, scouting and trapping surveys delimited infestations in three nonregulated counties and five partially regulated counties, all placed under regulation in May, 1959.

3. Statement or table of pest damage

No serious increase in beetle population was reported during the year. In regulated sections infestation was general, but light to medium in intensity. Limited defoliation was evident at numerous small spot infestations. In some sections, complaints of damage to flowering plants increased over the previous year. Significant turf damage was observed in central New Jersey and there were several reports of damage to city lawns in Pennsylvania.

D. Eradication or Control

1. Procedures or techniques used

Cooperative soil treatments were applied for eradication or suppression of isolated infestations in nonregulated sections in the region. Such treatments were also applied at some locations within regulated areas where beetle populations constituted a hazard of spread. In these operations granular dieldrin or heptachlor was applied at the rate of 2 to 3 pounds of actual material per acre. A jeep-mounted mechanical distributor was employed for application on areas accessible to motorized equipment. Manually operated seed casters were employed in other areas. To reduce or prevent development of hazardous adult beetle populations at packing sheds, loading

sites, railroad sidings, airports, etc., DDT emulsion sprays were applied to foliage and ground cover with mist blowers.

2. Accomplishments

During the report year, cooperative soil treatments, totalling 423 acres were applied at isolated infestations in nonregulated sections of Maine, Vermont, New York, and Virginia. In Maine, all areas where beetles were trapped during the summer of 1958 were treated in May, 1959, as follows: 17 acres in Gardiner, 1.6 acre in Lisbon Falls, and 5.5 acres in Waterville. In addition, one acre of lawns and flower beds was treated at Lewiston to minimize spread of the insect to a nearby plant growing establishment. In Vermont, 11 acres were treated in Montpelier and 18 acres in Barre. In the fall of 1958, control treatments were applied to a total of 27 acres in the communities of Sodus Point and Wolcott, Wayne County, New York. In Virginia, a total of 342 acres were treated in the City of Bristol.

During the summer adult flight season, control treatments were applied to foliage and ground cover at numerous sites, involving an estimated 4,385 acres. Included in these treatments were airports, crop growing, and loading sites, produce packing sheds, railroad sidings and truck concentration points.

E. Regulatory

1. Procedures or techniques used

Regulatory work is the major year-round program activity. The quarantine regulates the movement of soil, plant products, and certain other materials, and provides for their movement from regulated areas under certification. Regulated articles are certified on the basis of actual inspection, application of authorized treatments, or approved handling procedures.

2. Accomplishments

During the fiscal year, regulated articles with an estimated value of nearly 11 million dollars were certified for movement from regulated areas in this region. Inspectors made more than 17,000 field inspection calls to provide necessary certification services.

F. Methods Improvement

1. Work performed

In connection with nursery certification treatments, methods

for the distribution of granular formulations and for dipping plants were investigated. Work was also conducted on calibration of mechanical insecticide distributors.

2. Accomplishments

It was found that distribution was substantially uniform following cultivation when granular formulation was broadcast and subsequently planted with a row planter. A dipping formulation of aldrin was developed and approved, which eliminates plant injury caused to some plants by formulations containing ethylene dibromide.

G. Other

1. Cooperation received during fiscal year

a. Major contributions received

Partially-regulated states cooperated in scouting and trapping surveys and in the application of control treatments at isolated infestations. Cooperating state agencies participated to some extent on regulatory work by furnishing funds, personnel, equipment, or other services.

Entomology Research Division units and other research associates assisted in research efforts.

State cooperators and the Extension Service cooperated by issuing timely releases on various phases of the program to newspapers, radio, and television outlets.

b. Cooperative work needing strengthening another year

Available funds are not adequate to render the desired amount of regulatory service to affected industries. Certain States make little contribution to this program, responsibilities to their affected industries notwithstanding. Review of this situation with Plant Boards and industries concerned is recommended.

Extension and informational agencies could render additional assistance to the program by increasing assistance in the distribution of quarantine and control information to the general public through media available to them.

2. Associated activities and services

a. Program servicing

Program service was carried on throughout the year in the

form of informational exhibits at local fairs, flower shows, and agricultural meetings. Program movie and slide presentations and talks were given at high schools and colleges, and to other interested groups. Films were also made available for TV presentation. Numerous news articles were released for use by newspaper, radio, and TV outlets.

(1) Evaluation

All of these activities and services are essential to effective conduct of the program.

III. Recommendations for coming year

A. Survey

Continue trapping and scouting surveys in nonregulated areas of the region.

B. Eradication or control

Numerous small isolated sites apart from the main area of infestation still warrant control consideration.

C. Regulatory

Continue cooperative regulatory treatments to suppress beetle populations at airfields and other sites concerned with movement of articles and carriers to nonregulated destinations.

Continue emphasis on application of advance treatments of regulated articles to reduce inspection calls.

Continue training program. Prepare film or slide series covering treatment methods and procedures, and use of various kinds of equipment.

D. Methods Improvement

Continue efforts to develop or improve certification equipment.

E. Associated Activities

Keep the public informed of program activities through newspaper, radio, and TV releases. Increase efforts to display program exhibits at fairs, flower shows, etc., in order that the public may be aware of methods whereby they can suppress infestations on their properties.

SUMMARY OF REGIONAL ACTIVITY

EASTERN REGION

TABLE #1
FISCAL YEAR 1959

STATE	CERTIFICATION SERVICES					SURVEY				CONTROL (ACRES)	
	Shippers Serviced	Total Service Calls	Estimated Value Products Certified	Plots (Acres)	Bulk Soil (Cu. Yds.)	No. of Plants	Traps in Use	Visually Scouted*	Acres of New Infestations Outside Reg. Area	Soil	Foliage
A	B	C	D	E	F	G	H	I	J	K	L
Connecticut	XXX	1440	1624134	-	-	XXX	-	12	-	-	200
Delaware	XXX	794	98385	-	-	XXX	-	-	-	-	-
Maine	XXX	595	145820	-	-	XXX	696	44	-	25	-
Maryland	XXX	1353	944472	-	-	XXX	-	-	-	-	-
Massachusetts	XXX	1603	402562	-	-	XXX	-	272	-	-	6
New Hampshire	XXX	282	70059	-	-	XXX	-	15	-	-	80
New Jersey	XXX	3085	1748658	-	-	XXX	-	-	-	-	-
New York	XXX	2338	1900982	-	-	XXX	720	1099	-	27	-
Pennsylvania	XXX	3411	2311180	-	-	XXX	-	266	-	-	-
Rhode Island	XXX	450	404426	-	-	XXX	-	10	-	-	-
Vermont	XXX	500	18831	-	-	XXX	100	95	-	29	-
Virginia	XXX	1055	795409	-	-	XXX	200	1979	871	342	3216
West Virginia	XXX	269	357933	-	-	XXX	160	595	551	-	844
Washington, D. C.	XXX	22	9654	-	-	XXX	-	-	-	-	-
TOTAL THIS PERIOD	XXX	17197	10832505	-	-	XXX	1876	4387	1422	423	4346
Total from beginning of Program	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

* Exclude trap examinations.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for the fiscal year

Surveys for Japanese beetles were made in 319 counties of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Texas. New infestations were found on 544,447 acres in Georgia, North Carolina, South Carolina and Tennessee.

B. Major deviation from work plan

None

C. Status of Program at close of year

Established Japanese beetle infestations have been found in 113 counties of the 4 known infested states in the Southern Region, with population densities ranging from large, heavily infested areas in the eastern section of North Carolina, to light, scattered infestations in the mountain section of Tennessee.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

The program is planned and directed jointly by the Plant Pest Control Division and the cooperating State Plant Pest Control Agencies. The Division assumes the major responsibility for field direction of survey and control, while direction of quarantine work is jointly shared.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Farmers, nurserymen and others are currently informed of quarantine requirements as new procedures are developed to safeguard the movement of regulated articles into normal trade channels with a minimum of expense and inconvenience.

2. Technical assistance provided to Program by cooperating agencies

The Extension Service in each state has been active in disseminating information on the Japanese beetle to home owners concerned with controlling beetles damaging ornamental plantings and lawns.

C. Survey

1. Procedures or techniques used

Traps, baited with an attractant, were mainly used in Japanese beetle surveys to locate and delimit new infestations, to indicate control needs, and to measure density of population. These traps were placed in strategic locations such as produce markets, airports, trucking centers, nurseries, and other points most likely to be exposed to infestation by "hitchhiking" beetles.

2. Accomplishments

Japanese beetle surveys were made in 6,164 locations in 319 counties of the 11 states of the Southern Region. New infestations were found on 544,447 acres in Georgia, North Carolina, South Carolina and Tennessee, along with extensions in counties already known to be infested.

3. Statement or table of pest damage

The root-feeding grub destroys grass in pastures, lawns and golf courses, and the adults feed on leaves of grapes, peaches, apples, and many other farm and ornamental crops. Very little damage has been caused except in North Carolina where severe damage has occurred in corn and pastures.

D. Eradication or Control

1. Procedures or techniques used

Foliage sprays were applied to all areas where beetle populations were developing to a hazardous level.

2. Accomplishments

A total of 6,533 acres in Georgia, North Carolina and Tennessee received soil treatment, and 1,382 acres were treated with foliage sprays in Georgia and North Carolina.

E. Regulatory

1. Procedures or techniques used

Most nurseries are using approved soil treatment methods to meet certification requirements. Some small nurseries rely on individual plant treatment at time of shipment where overall soil treatment is not practical. Foliage applications are also used in the vicinity of markets and shipping points to reduce hazardous population levels.

2. Accomplishments

Certification service included 2,207 service calls, with certified products valued at $968,424.

F. Methods Improvement

A shaking device was developed as an attachment to the regular string bean grading machines in North Carolina which was very efficient in removing adult beetles from beans before shipment to noninfested areas.

III. Recommendations for coming year

A. Survey

Trapping and visual scouting should be extended in nonregulated counties. Special surveys to determine density of population should be conducted in the vicinity of airports, produce markets, nurseries and other areas where danger of dissemination may develop.

B. Eradication or Control

Control operations should be maintained at airports and fresh fruit and produce markets which ship outside the regulated area.

Small isolated infestations should be treated immediately to prevent further spread.

C. Regulatory

None.

D. Methods Improvement

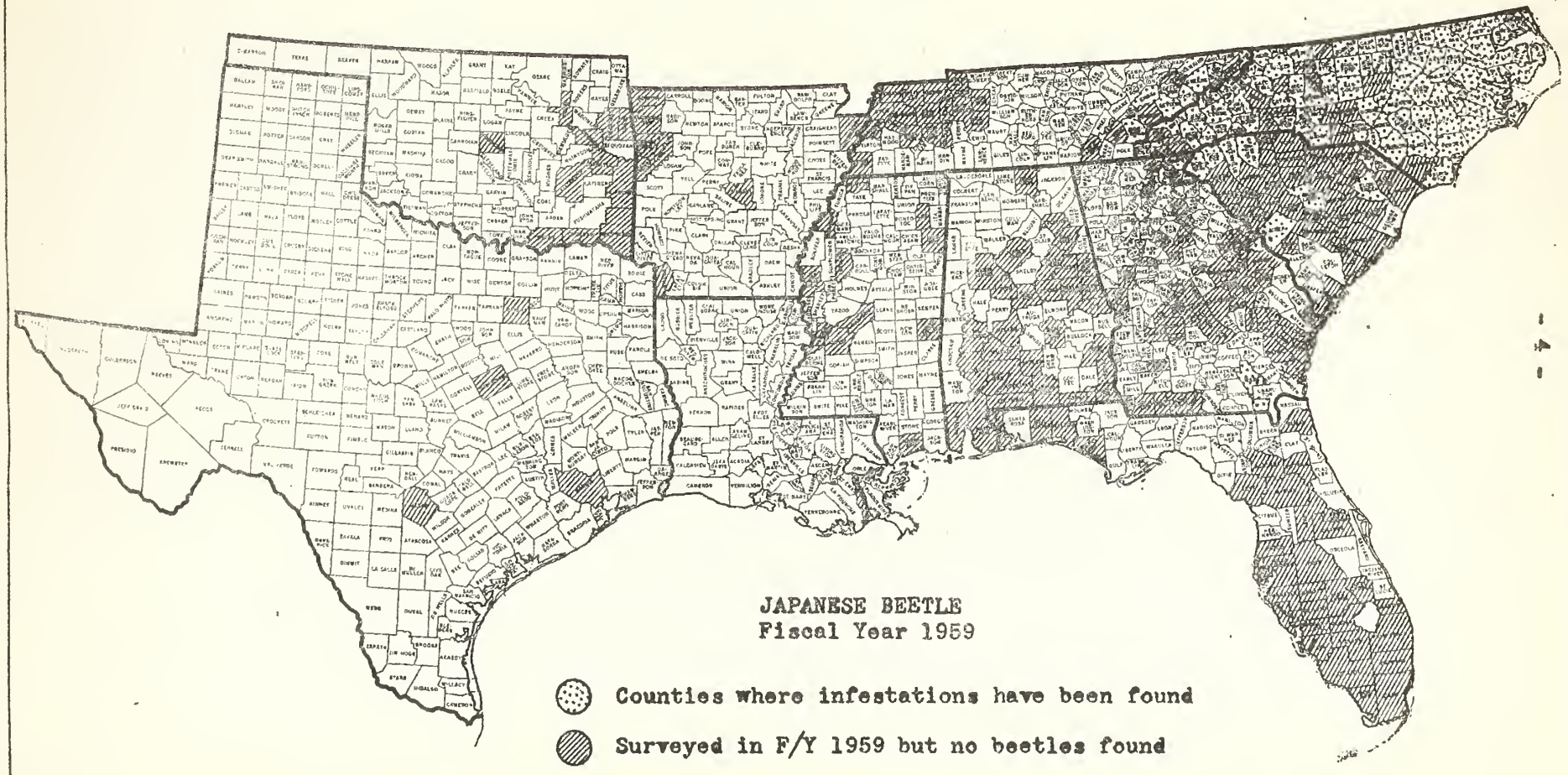
A less expensive method of eradication would be desirable. It has been suggested that milky disease be utilized to hold populations at a low level until satisfactory methods of eradication could be devised or developed.

E. Associated Activities

It is recommended that special efforts be made to acquaint the general public with the serious nature of this pest.

SOUTHERN REGION

PLANT PEST CONTROL DIVISION



JAPANESE BEETLE
Fiscal Year 1959

Counties where infestations have been found

Surveyed in F/Y 1959 but no beetles found

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

JAPANESE BEETLE

REGION: Southern

PREPARED BY:

PERIOD (*Designate: Month 1-15, 16-31, or 1-31*): Fiscal Year 1959

DATE PREPARED:

STATE AND COUNTY	CERTIFICATION SERVICES						SURVEY			CONTROL (*Acres*)	
	* SHIPPERS SERVICED	TOTAL SERVICE CALLS	ESTIMATED VALUE PRODUCTS CERTIFIED	(Nursery) PLOTS (*Acres*)	BULK SOIL (*Cu. Yds.*)	NO. OF PLANTS	* TRAPS IN USE	(Locations) VISUALLY SCOUTED*	ACRES OF NEW INFESTATIONS OUTSIDE REGULATED AREA	SOIL	FOLIAGE
A	B	C	D	E	F	G	H	I	J	K	L
Alabama	0	0	0	0	0	0	188	363	0	0	0
Arkansas	0	0	0	0	0	0	52	0	0	0	0
Florida	0	0	0	0	0	0	351	100	0	0	0
Georgia	0	0	0	0	0	0	1,062	80	89,780	1,080	375
Louisiana	0	0	0	0	0	0	20	0	0	0	0
Mississippi	0	0	0	0	0	0	52	0	0	0	0
N. Carolina	68	2,181	$939,132.00	124.55	0	0	456	1,723	117,124	3,169.6	1,007
Oklahoma	0	0	0	0	0	0	45	0	0	0	0
S. Carolina	2	26	$ 29,292.50	.50	0	0	624	2,499	331,500	3	0
Tennessee	0	0	0	80.00	0	0	537	1,399	6,043	2,280	0
Texas	0	0	0	0	0	0	36	0	0	0	0
TOTAL ~~MISSISSIPPI~~	70	2,207	$968,424.50	205.05	0	0	3,423	6,164	544,447	6,532.6	1,382
TOTAL FROM JULY 1											
TOTAL FROM BEGINNING OF PROGRAM											

PPC Form 7-9
Feb 1959

Exclude trap examinations.

* Highest number during any one month during F/Y 1959.

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Japanese Beetle

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: _____

Region. Southern

Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest. Maps & Posters	
Florida	-	-	1	-	-	-	-	-	-	-	10	-
Georgia	3	3	2	-	-	-	3	1	13	20	5	-
Tennessee	-	-	-	-	-	-	-	-	25	-	-	-
Total	3	3	3	-	-	-	3	1	38	20	15	-

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE SURVEY

July 1, 1958 - June 30, 1959

In Cooperation with Other
Federal, State, County, and Local Agencies

November 13, 1959
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

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I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishments for the fiscal year

During the fiscal year 1959, 22 initial inspections were made of establishments, including warehouses, feed mills, malting plants, seed storage bins, and seed-processing plants. Five railway freight cars that originated in areas infested with khapra beetle were fumigated. No khapra beetles were found in 63 specimens submitted for identification.

B. Major deviation from work plan

No major changes.

C. Status of program at close of year

From the beginning of the program to June 30, 1959, 2,045 initial and 330 repeat inspections have been made of different establishments that were considered possible locations for the khapra beetle. Of the 603 collections sent in for identification, none were identified as Trogoderma granarium.

II. PROGRAM ACTIVITIES DURING THE FISCAL YEAR

A. Planning and direction

The program was planned and directed by personnel of the Plant Pest Control Division and cooperators in the various states. The premises of establishments handling grain, feed products, seeds, grain bags, and other possible carriers of beetles that had been shipped from infested states and countries received priority in our inspection work.

B. Technical assistance

Published information concerning this pest was made available to the public by the Division and cooperating State personnel. Colored slides and films were also shown at meetings arranged by county agents, extension specialists, and experiment station workers.

C. Survey

Surveys were made by field personnel who have been trained to make inspections for the khapra beetle. Every effort was made to train State personnel so that they could assist in the inspection work. The establishments inspected were gone over thoroughly

by the inspectors, who checked grain bins, debris, dust piles, grain bags, and all other possible carriers for the presence of beetle larvae or adults. Trogoderma specimens were collected and forwarded to Dr. P. W. Oman, Entomology Research Division, Plant Industry Station, Beltsville, Maryland, for species identification.

D. Eradication or control

Not applicable, as the pest has not been found in this Region.

E. Regulatory

Five railway freight cars suspected of being infested with khapra beetle were treated during the fiscal year. Four of these cars were fumigated with methyl bromide gas by commercial pest control operators. The approved method as stipulated in the Manual of Approved Treatment Procedures was used. These cars were fumigated at Granite City and Chicago, Illinois, Oelwein, Iowa, and Belle Fourche, South Dakota. One freight car in Minnesota was in such poor condition that the railroad company removed the top flooring, swept the interior of the car, and burned the flooring and debris. The car was then sprayed with a solution of malathion in water at the rate of 5 pounds per 100 gallons of water.

F. Methods improvement

As our inspectors gained experience in inspecting for khapra beetle, every effort was made to improve survey and inspection methods so that they were more efficient. The adult beetles and larvae are difficult to detect.

G. Other

The milling industries and processors of grain products, the railroads, seed dealers, and firms that handle grain bags all recognized that the khapra beetle is a dangerous pest. They were very cooperative and anxious to have their premises inspected.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

With the opening of the St. Lawrence Seaway route through the Great Lakes, inspection for khapra beetle becomes increasingly important. Special emphasis will be placed on the inspection of establishments in those states having ports on the Great Lakes.

B. Eradication or control

Not applicable.

C. Regulatory

Prompt effort will be made to fumigate or treat railroad cars or other carriers that move into the Central Region from the infested areas.

D. Methods improvement

Efforts should be continued to improve survey and inspection activities, and to train more State and Federal employees to make inspections.

E. Associated activities

Greater emphasis should be placed on informing the public of the damage that the khapra beetle can do to stored-grain products. The importance of sanitation measures in controlling all pests of stored grain should be stressed. The press, TV, and radio offer effective means of bringing this information to the public.

Khapra Beetle - Accomplishments During Fiscal Year 1959

State	Inspections			Specimen Collections for Ident.	Infested Sites F.Y.	Total Sites Infested	Sites to be Treated	Est. Current Infested Vol. (Cu. Ft.)	Total Vol. Infested from Beginning	Total Infested Vol. to be Treated
	Initial	Repeat	Total							
Kansas	3	0	3	20	0	0	0	0	0	0
Minnesota	9	0	9	43	0	0	0	0	0	0
Missouri	10	0	10	0	0	0	0	0	0	0
Totals	22	0	22	63	0	0	0	0	0	0

Khapra Beetle - Summary of Associated Activities - Fiscal Year 1959

State	Public Meetings Attended	Presentations: Talks	Slides	Films	Radio	TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins*	Circulars*	Infest. Maps & Posters	Other
FEDERAL:												
Michigan	0	7	6	0	0	0	1	0	0	0	0	0
Minnesota	0	0	10	0	0	0	0	0	0	5	2	0
North Dakota	1	0	0	0	0	0	0	0	0	50	0	0
South Dakota	1	0	0	0	0	0	0	0	0	50	0	0
Subtotals	2	7	16	0	0	0	1	0	0	105	2	0
COOPERATORS:												
North Dakota	1	1	1	0	0	0	0	0	0	0	0	0
South Dakota	1	1	1	0	0	0	0	0	0	0	0	0
Subtotals	2	2	2	0	0	0	0	0	0	0	0	0
Totals	4	9	18	0	0	0	1	0	0	105	2	0

*Written by Federal personnel for release direct or through cooperators.
**This is a conservative estimate.

Khapra Beetle - Cooperative Aid Received - Fiscal Year 1959

State	Cash and Equivalent Aid				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Kansas	0	0	0	0	0	$200.00	$200.00
Minnesota	0	300.00	0	0	$300.00	0	300.00
Missouri	0	100.00	0	0	100.00	200.00	300.00
Nebraska	0	0	0	0	0	400.00	400.00
North Dakota	0	0	0	0	0	300.00	300.00
South Dakota	0	0	0	0	0	300.00	300.00
Wisconsin	0	0	0	0	0	200.00	200.00
Totals	0	$400.00	0	0	$400.00	$1,600.00	$2,000.00

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is a definite replacement value.

**Limited to services incidental to other activities for which only an estimated value is available.

Khapra Beetle - Expenditures by Source and by Activity, Fiscal Year 1959

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	None.							
Other Organi,ations:								
Minnesota	0	0	0	$300.00	0	0	0	$300.00
Missouri	0	0	100	0	0	0	0	100.00
Subtotals	0	0	100	$300.00	0	0	0	$400.00
CONTRIBUTED SERVICES**								
Kansas	0	0	200	0	0	0	0	$200.00
Missouri	0	0	200	0	0	0	0	200.00
Nebraska	0	0	200	200	0	0	0	400.00
North Dakota	150	150	0	0	0	0	0	300.00
South Dakota	150	150	0	0	0	0	0	300.00
Wisconsin	0	0	200	0	0	0	0	200.00
Subtotals	$300	$300	$800	$200	0	0	0	$1,600.00
GRAND TOTALS	$300	$300	$900	$500	0	0	0	$2,000.00

*Direct appropriation, allotments other sources, services, and supplies for which there is a definite replacement value.

**Services incidental to other activities, for which only an estimated value is available.

(*--*)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1958 - June 30, 1959

COOPERATING AGENCIES:

State Plant Pest Control Agencies
and Extension Service
and
Plant Pest Control Division
Agricultural Research Service
U. S. Department of Agriculture

November 1959
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

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I. Highlights of year's program activity

A. Accomplishments for the fiscal year

Khapra beetle surveys were continued in most states in the Region, inspections being made at grain mills and elevators, and at feed, grain and seed stores at various locations. Emphasis was placed on establishments receiving grain shipments from the Southwest. During the year, 517 establishments were initially inspected and 154 were reinspected. As a result, 88 suspect specimens were collected and submitted for identification. None were determined to be khapra beetle.

B. Major deviation from work plan

There were no deviations from work plans.

C. Status of program at close of year

To date, no infestation has been found in this region.

II. Program activity during fiscal year

A. Planning and direction

Survey plans were developed and directed jointly by PPC Supervisors in Charge and cooperating state officials.

B. Technical assistance

1. Technical assistance provided to farmers and others by program personnel.

State and Federal personnel furnished information on the insect to industries concerned, the general public and others. USDA leaflet #PA-261 was useful in disseminating information.

2. Technical assistance provided to program by cooperating agencies. Specimen determinations were made by the Entomology Research Laboratory, Beltsville, Maryland.

C. Survey

1. Procedures or techniques used

a. County Agents and establishment operators were contacted, informed of the damage potential of the insect, and queries as to any damage noted in stored grain were made. Premises and storage facilities were inspected. Debris and deposits were collected and examined under magnification for insect infestation. Specimens resembling khapra beetle were submitted for identification.

Most inspections were made during winter months and in conjunction with other activities.

b. Specimen determinations were made at the Entomology Research Laboratory, Beltsville, Maryland.

2. Accomplishments

Many new grain storage sites were inspected as a result of this year's activities. All specimens submitted were negative.

3. Statement or table of pest damage

No evidence of khapra beetle infestation has been encountered in this region.

D. Eradication or Control

1. Procedures or techniques used

Not applicable.

2. Accomplishments

Not applicable.

E. Regulatory

1. Procedures or techniques used

Not applicable.

2. Accomplishments

Not applicable

F. Methods Improvement

1. Work performed

Not applicable.

2. Accomplishments

Not applicable

G. Other

1. Cooperation received during fiscal year

Excellent cooperation was extended by the State and County cooperating personnel, as well as by industries concerned. Some state agencies furnished inspectors for survey activities. Owners of various storage and processing plants cooperated fully and showed an active interest in the work.

2. Associated activities and services

USDA leaflet #PA 261, talks and slides were used to disseminate information to interested individuals and groups.

III. Recommendations for coming year

A. Survey

Extend inspections to include establishments not previously inspected and continue reinspections.

B. Eradication or Control

Not applicable.

C. Regulatory

Not applicable.

D. Methods Improvement

Not applicable.

E. Associated activities

Not applicable.

KHAPRA BEETLE INSPECTION SUMMARY

EASTERN REGION

FISCAL YEAR 1959

STATE	INSPECTIONS INITIAL	INSPECTIONS REPEAT	INSPECTIONS TOTAL	SPECIMEN COLLECTIONS SUBMITTED FOR IDENTIFICATION	INFESTED SITES THIS PERIOD
Connecticut	13	3	16	-	-
Maine	4	6	10	9	-
Massachusetts	3	-	3	4	-
New Hampshire	23	-	23	13	-
New Jersey	83	131	214	12	-
New York	108	14	122	19	-
Pennsylvania	204	-	204	25	-
Rhode Island	-	-	-	-	-
Vermont	16	-	16	-	-
Virginia	1	-	1	3	-
W. Virginia	62	-	62	3	-
Total from July 1	517	154	671	88	-
Total from Beginning of Program	1,294	323	1,617	709	

Page 1 of 2 pages
Page 2 "Not Applicable"

PPC Form 7-18

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
MEXICO REGION

ANNUAL PROGRAM REPORT

Khapra Beetle Program

July 1, 1958 - June 30, 1959

In cooperation with

MEXICAN DEFENSA AGRICOLA

November 16, 1959
Monterrey, N. L., Mexico

W. K. Clore
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the Fiscal Year

All known khapra beetle infestations in Mexico had been given an eradication fumigation treatment by the end of the fiscal year. A total of sixteen properties were treated. Of these, four were carry-overs from fiscal year 1958 and the remaining twelve were properties found infested during fiscal year 1959.

Khapra beetle surveys were conducted in the states of Baja California, Sonora, Jalisco, Michoacán, Coahuila, Durango, Chihuahua, Tamaulipas, Nuevo León and Distrito Federal. Those conducted in all states, other than Baja California and Sonora were for the purpose of delimiting the five known infestations at Guadalajara, Jalisco, from which commodities had been shipped prior to their treatment. In the State of Chihuahua an additional survey was made in Cd. Juarez and surrounding area after the discovery of khapra beetle in El Paso, Texas. Two small infestations were found in Cd. Juarez as a result of the intensive survey which was in progress at the close of this fiscal year.

All properties found infested were immediately placed under quarantine and the movement of commodities restricted except under certificate of treatment or until the property had received an eradication fumigation.

B. Major Deviation from Work Plan

The original work plan called for surveys and treatments only in the States of Baja California and Sonora. After the discovery of khapra beetle in Guadalajara, Jalisco and El Paso, Texas they were extended to include all locations in states that had received commodities from the infested sites in these locations. And after the finding of the two infested properties in Cd. Juarez, the survey was extended and intensified in that immediate zone.

C. Status of Program at Close of Year

Apparently all known infestations have been eradicated in Mexico; however, it is essential that an intensive survey program be continued to assure that there are no remaining infestations.

II. Program Activities During Fiscal Year

A. Planning and Direction

The program was planned and directed jointly by supervising personnel of the Defensa Agrícola of México and the Plant Pest Control Division of the United States Department of Agriculture.

B. Technical Assistance

1. Technical Assistance Provided to Farmers and Others by Program Personnel

Owners of infested or quarantined properties were advised of ways and means of treatment and handling of products to permit movement before eradication fumigation of their property.

2. Technical Assistance Provided to Program by Cooperating Agencies

The Agricultural Marketing Service, and the California and Arizona Experiment Stations, through research, provided current information on fumigation and eradication procedures as well as commodity treatments.

C. Survey

1. Procedures or Techniques Used

For the purpose of inspection, properties were divided into two general categories, namely, distributors or dealers and consumers. Distributors are flour mills, warehouses, jobbers, wholesalers, and retailers; consumers constitute feed lots, dairies, chicken ranches and similar properties.

In the Mexicali Valley of the State of Baja California and the Juarez district in the State of Chihuahua, inspections were made of most properties falling within the two categories, while in other locations and states only properties in category one were inspected. All properties that received an eradication treatment were placed on a 90-day schedule of inspection for a period of twelve months.

2. Accomplishments

A total of 3,803 properties were inspected in Mexico and of these, 2,215 were initial inspections and 1,588 were repeat. There were 1,851 specimen collections submitted for determination resulting in 12 infestations as follows: five in Guadalajara, Jalisco, four in Mexicali Valley, Baja California, one in San Luis Rio Colorado Valley, Sonora and two in Cd. Juárez, Chihuahua. (See table No. 1).

Movement of commodities from infested warehouses were traced, located and properties receiving the shipments were inspected.

3. Statement or Table of Pest Damage

There were no commercial damage to commodities.

D. Eradication or Control

1. Procedures or Techniques Used

All fumigations and treatments were done with the objective of complete eradication. The structures or objects to be fumigated were sealed under leak-proof tarpaulins. Prior to sealing under the tarpaulins, the ground around the sturcture, for at least 100 feet distance or to the boundary of the property, if closer, was given two treatments with malathion and oil. When the structure was ready for fumigation, methyl bromide was introduced through induction hose and sampling of gas concentration was made by instrument through tubes in order to maintain a 32-ounce per 1,000 cubic feet concentration for not less than 24 continuous hours during the required 48-hour period.

Tarping of structures of more than 50,000 cubic feet was done by commercial operators under contract. In structures of less than 50,000 cubic feet, the entire operation was performed by and under the supervision of Plant Pest Control personnel in cooperation with the Defensa Agrícola of México.

2. Accomplishments

Eradication fumigations were accomplished on 16 infested properties involving 9,896,840 cubic feet. Four of the properties were carry-overs from the previous fiscal year and 12 were found infested during the current fiscal year. At the close of the fiscal year, all known infestations in México had received eradication fumigations. (See table No. 2).

E. Regulatory

1. Procedures or Techniques Used

Regulatory activities are accomplished under the authority of Mexican Interior Quarantine No. 10, which is similar to Plant Pest Control Khapra Beetle Quarantine No. 76 in operation in the United States. It provides principally for the restriction of movement of products from infested sites rather than from areas designated as infested. This is qualified, however, in that certificates of treatment are required for the movement of used sacks out of the Mexicali, B. C. and San Luis R. C., Sonora zones to other parts of Mexico.

Regulations have been tightened on products moving from El Paso, Texas and the State of New Mexico through the Juarez port of entry into Mexico.

2. Accomplishments

All properties found infested were immediately quarantined and commodity fumigations were required of all products moving from the properties prior to the eradication fumigation of the infested site. Certificates of treatment were issued by Defensa Agrícola personnel. All used sacks moving out of the Mexicali district were required to carry a certificate of fumigation. Southbound trucks were checked for certificates at the San Luis, Sonora road station and rail shipments were checked at the Mexicali railroad station.

F. Methods Improvement (None)

G. Other

1. Cooperation Received During Fiscal Year

The program is cooperative between the Defensa Agrícola and the Plant Pest Control Division and is conducted through a Memorandum of Understanding between the two official agencies. The Defensa Agrícola shared in salary payments of Mexican Nationals employed for surveys and furnished some personnel in treatments of infested properties. The Plant Pest Control Division furnished supervisory personnel for surveys. For fumigations, the two agencies shared in supervisory personnel, as well as in the cost of the treatments.

2. Associated Activities and Services

A khapra beetle work conference was held in Yuma, Arizona May 14-15, 1959, with representatives from Plant Pest Control Division, the Defensa Agrícola of México and the state departments of agriculture of California, Arizona and New Mexico in attendance. Accomplishments and problems of survey and treatments were discussed.

III. Recommendations for Coming Year

A. Survey

It is recommended that inspections and surveys be continued and that the survey crews be strengthened so that all possible sources of infestation and reinfestation may be traced and infestations eradicated.

B. Eradication or Control

If infestations are found, it is recommended that present procedures be followed by personnel of the two cooperating agencies in Mexico.

C. Regulatory

Regulatory procedures as conducted this fiscal year should be continued.

D. Methods Improvement (Not applicable)

E. Associated Activities

Work conferences among agencies with common problems should be continued.

Table 1

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

Mexico Region

KHAPRA BEETLE INSPECTION SUMMARY

Fiscal Year 1959

State	Inspections			Specimen Collections submitted for identification	Sites found infested this fiscal yr	Total sites found infested fr begin.	Est. of vol. found infested this fiscal year (cu. ft.)	Total vol. infested from beginning (cu. ft.)	Total vol. infested yet to be treated
	Initial	Repeat	Total						
A	B	C	D	E	F	G	I	J	K
COAHUILA	3	0	3	45					
DURANGO	4	1	5	42					
CHIHUAHUA	1,062	39	1,101	261	2	2	157,806	157,806	
NUEVO LEON	1	0	1						
TAMAULIPAS	1	0	1	15					
BAJA CALIF.	921	1,361	2,282	658	4	78	1.622;775	16.460;862	
SONORA	122	153	275	105	1	2	32;500	304;643	
JALISCO	87	33	120	595	5	5	7.954,180	7.954,180	
MEXICO, D.F.	11	0	11	95					
MICHOACAN	3	1	4	35					
Total F. Y.	2,215	1,588	3,803	1,851	12	////////	9.767,261	//////////	0
T O T A L From Beginning of Program	6,141	1,944	8,085	3,246	//////	87	//////////	24.877,491	//////////

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

Table 2

Mexico Region

KHAPRA BEETLE TREATMENT SUMMARY

Fiscal Year 1959

State	SITES TREATED		VOLUME TREATED (cu.ft.)		METHYL BROMIDE USED (lbs.)	
	Since July 1st	Since Beginning	Since July 1st	Since Beginning	Since July 1st	Since Beginning
A	C	D	F	G	I	J
Rep. of Mexico	16	67	9,896,840	24,877,491	77,572	211,404

Sites Treated and Held for Final Clearance Inspection (Category 2)

State	PROPERTIES TREATED		CUBIC FEET TREATED		Name of Sites Held
	Since July 1st	Since Beginning	Since July 1st	Since Beginning	
A	C	D	F	G	H
Rep. of Mexico	3	5	83,980	1,094,719	Jorge Robles Francisco Gutierrez Rancho Kee Lee

Retreatments (From Beginning of Program)

State	PROPERTIES TREATED		CUBIC FEET TREATED		Remarks
	Since July 1st	Since Beginning	Since July 1st	Since Beginning	
A	C	D	F	G	H
Rep. of Mexico	1	4	1,518,500	3,420,713	

TABLE 3

PROGRAM COST DISTRIBUTION

AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

TABLE 3 — PROGRAM COST DISTRIBUTION

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

NAME OF PROGRAM: KHAPRA BEETLE | OPERATING UNIT: MEXICO REGION | SIGNATURE: Reg. Superv. [signature] | DATE: 16 NOV 1959 | FISCAL YEAR: 1959

SOURCE OF CASH AND EQUIVALENT (A) *	PLANNING AND DIRECTION (B)	TECHNICAL ASSISTANCE (C)	SURVEY (D)	CONTROL (E)	REGULATORY (F)	METHODS IMPROVEMENT (G)	OTHER (H) Not Sub-divided	TOTAL (I)
1. PLANT PEST CONTROL ARS								
Headquarters	6,590							6,590
East Mexico	2,206		8,670					10,876
West Mexico	10,845		15,288	199,105	32,543		4,500	262,281
2. SUB-TOTAL	19,641		23,958	199,105	32,543		4,500	279,747
3. OTHER								
West Mexico								
Defensa Agricola				33,606			10,311	43,917
PATRONATOS							2,210	2,210
4. SUB-TOTAL				33,606			12,521	46,127
5. T O T A L	19,641		23,958	232,711	32,543		17,021	325,874
6. CONTRIBUTED SERVICES								
West Mexico								
Mexican Fed. Gov't.							871	871
7. T O T A L							871	871
8. GRAND TOTAL	19,641		23,958	232,711	32,543		17,892	326,745

* Column A: List entries in the following order:

1. PLANT PEST CONTROL DIVISION units. Name states. Include only direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

2. Sub-total for all PPC funds included in (1).

3. OTHER ORGANIZATIONS. Name organizations by States. Include only direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure, or measurable cash expenditure.

4. Sub-total for all OTHER ORGANIZATIONS, funds included in (3).

5. Totals of PPC and OTHER ORGANIZATIONS, funds included in (2) plus (4).

6. CONTRIBUTED SERVICES. Name organizations by State. Limit to services incidental to other activities for which only an estimated value is available.

7. Total of CONTRIBUTED SERVICES, items included in (6) only.

8. GRAND TOTAL of (5) and (7) entries.

NAME OF PROGRAM

OPERATING UNIT

DATE

FISCAL YEAR

SOURCE OF CASH AND EQUIVALENT	(A) PLANNING AND DIRECTION	(B) TECHNICAL ASSISTANCE	(C) SURVEY	(D) CONTROL	(E) REGULATORY	(F) IMPROVE METHODS	(G) OTHER	(H) TOTAL
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1958 - June 30, 1959

In cooperation with other
Federal, State, County, and Local Agencies

November 13, 1959
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for the fiscal year

The first khapra beetle infestation in the Southern Region was found in El Paso, Texas, in February 1959. Immediately a State Quarantine was placed on this property, and fumigation of all products leaving this establishment was required until such time as the entire plant and premises could be treated. Twenty additional infested properties were found in the El Paso area during the fiscal year.

Preparations were made to fumigate all infested properties. A program of treatment was set up in which properties of less than 100,000 cubic feet would be fumigated by State and Federal personnel, and larger properties fumigated under contract with commercial concerns. As other properties were found infested in New Mexico of the Western Region, and in Juarez, Mexico, of the Mexico Region, it was decided that bids would be advertised by the Western Region to treat certain properties in the Western, Mexico, and Southern Regions. A contract was awarded to a commercial Pest Control Company to fumigate infested properties in the vicinity of El Paso, Texas. The first property to be treated under this contract was completed April 27, a little over two months after the initial finding. State and Federal agencies began fumigation of smaller properties on March 18, and all properties were completed by the end of the fiscal year. Intensive surveys were carried on in 145 counties in the Texas area, and detection surveys were made in most of the other states of the Region.

B. Major deviation from Work Plan, if any

Until the khapra beetle was found in El Paso, Texas, the only work on this program had consisted of survey. This infestation, of course, made it necessary to intensify surveys and begin emergency treating programs immediately.

C. Status of Program at close of year

At the close of the year, 21 properties had been found infested in Texas, and 1 probable infestation, making a total of 22. Nineteen properties, including the probable infestation, had been treated by the close of the fiscal year, leaving 3 properties to be treated in the next fiscal year.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

Survey plans were under the direction of the state supervisors, and were put into effect by district supervisors and their field personnel.

With the finding of the khapra beetle infestation in El Paso, along with infestations in adjoining New Mexico and Mexico, the treating work became a cooperative undertaking with joint participation by the State Departments of Agriculture and Federal Department of Agriculture in Texas, New Mexico, and the Republic of Mexico.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Technical assistance was provided by program personnel to grain dealers doing commodity fumigation in connection with the Khapra Beetle Program . Commodity fumigation involves the fumigation of grain, or grain products, and any other materials which might carry the khapra beetle, and is done for the purpose of permitting movement of such products until the entire plant can be fumigated. Commodity fumigation is usually paid for by the owners, and personnel is furnished only for observation and such technical assistance as may be necessary.

C. Survey

1. Procedures or techniques used

a. Field

Visual inspections for the khapra beetle were made in warehouses mostly by the use of flashlights. Examination was made also of materials such as sacks and burlaps used in transporting host material of the khapra beetle. Locations that had received shipments in the past from infested areas were carefully inspected.

Trapping operations consisted of "trap sacks," which are sacks folded and tied with string and lowered into silos or other likely infested spots for several days.

b. Laboratory

All collections were submitted to Division headquarters in Washington for determination.

2. Accomplishments

A total of 2,292 inspections were made in 145 counties in the Texas Area. Of the above inspections, a total of 949 were made in El Paso County alone. Eighty-two traps were operated in El Paso County, and 192 in Lubbock County with no infestations being found by this method. In other states of the Region, 482 inspections were made in 105 counties without finding the beetle.

3. Statement or table of pest damage

There was some economic damage to grain and grain products at one feed store, but the other infestations had not built up to damaging numbers when found.

D. Eradication or Control

1. Procedures or techniques used

A program was set up to fumigate all known infested properties. The procedure in fumigating a property first consists in spraying of the premises around the building with malathion. The premises are sprayed three times; before fumigation, during fumigation, and following fumigation. Fumigation of the buildings consists of wrapping the entire property with gas-tight tarpaulins. Initial application of the fumigant is at the rate of 5 pounds per thousand cubic feet. During the fumigation, the concentration levels are checked frequently.

2. Accomplishments

At the close of the fiscal year, 19 properties consisting of 1,299,848 cubic feet had been treated. There were 111 commodity fumigations at four establishments amounting to approximately 132,600 cubic feet.

E. Regulatory

1. Procedures or techniques used

Regulatory procedures consisted of immediately placing all infested properties under state emergency quarantine. Upon fumigation of a property under category 1, it is immediately released. Properties fumigated under categories 2 and 3 are retained under quarantine for a period of one year from the date of fumigation. During the interval between the time a property is found infested until it is fumigated,

commodities, consisting of grain or grain products or any material that might carry the khapra beetle, are required to be fumigated if moved from the premises.

Master certificates are used for the certification of bulk shipments of restricted articles moving by rail, boat, truck or other carrier. A certificate to be affixed to the container is used for the certification of individual packages of regulated articles moving outside the regulated area by express, parcel post, or automobile.

2. Accomplishments

By the close of the year, 544 master certificates and 1,528 tag certificates had been issued to cover the movement of treated commodities from four establishments under quarantine in Texas.

F. Methods Improvement

1. Work performed

Not applicable

2. Accomplishments

Not applicable

G. Other

1. Cooperation received during fiscal year

a. List major contributions received and show importance to program (other than funds)

Cooperating state agencies furnished an equitable portion of the inspectors for making surveys. During the fumigation and survey period, immediately following the initial finding in Texas, the state furnished almost twice as many men as the Division.

Property owner participation consisted mainly in commodity treatments by furnishing labor and purchasing fumigants.

b. Cooperative work needing strengthening another year

Not applicable

2. Associated activities and services

a. Program servicing

(1) Evaluation

Presentation of the program to the public was made through showing of Khapra Beetle film, feature and news stories, radio and TV programs and through attendance at public meetings.

III. Recommendations for coming year

A. Survey

It is recommended that comprehensive surveys be continued in all states of the Southern Region. It is especially recommended that all feed stores in El Paso and the premises of all the customers of these feed stores be surveyed frequently.

B. Eradication or Control

Not applicable

C. Regulatory

None

D. Methods Improvement

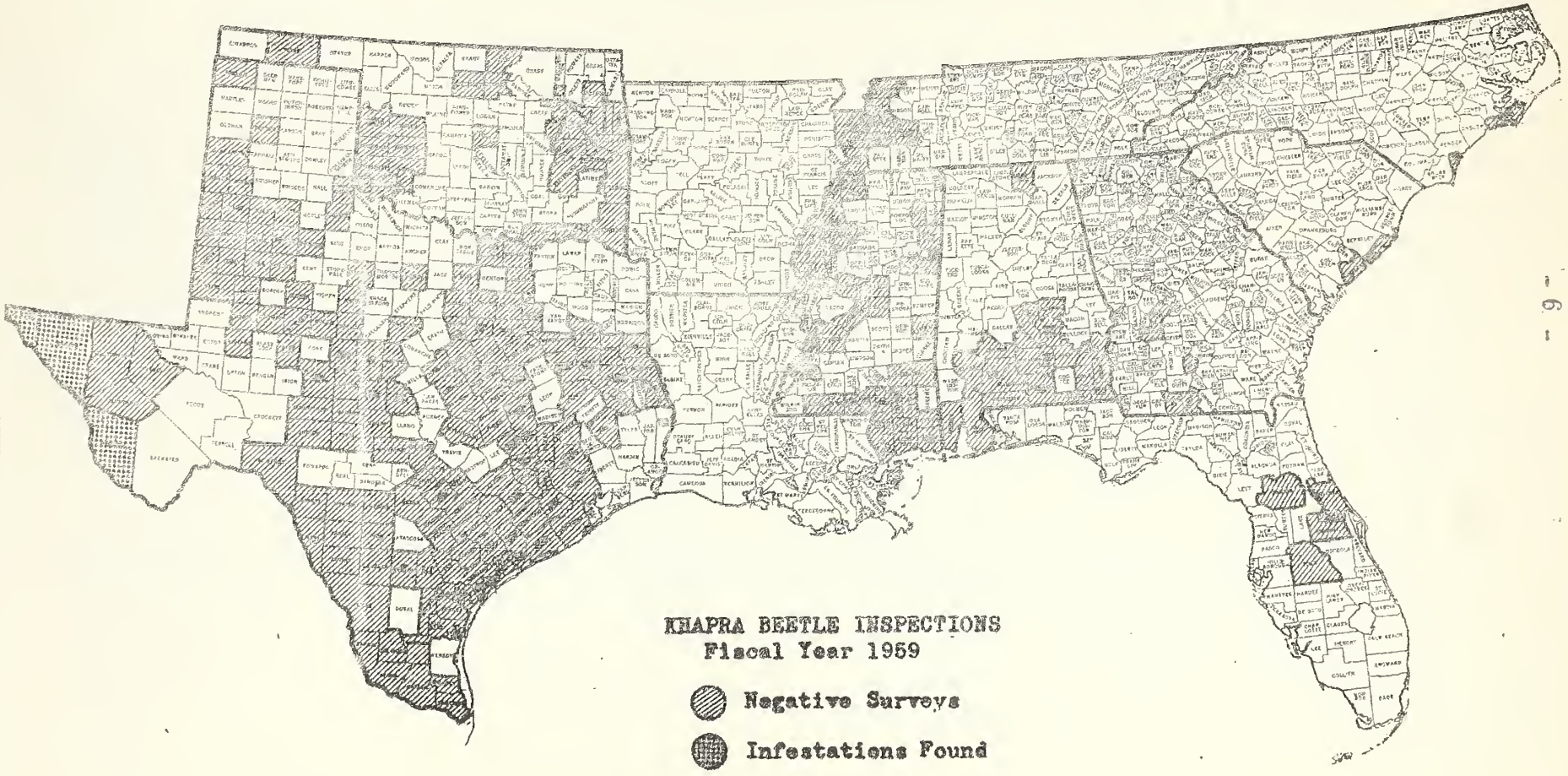
It is recommended that research results be supplied to field employees on the fumigation of grocery stores, with particular reference to edible products that should not be fumigated with methyl bromide.

E. Associated activities

Not applicable.

SOUTHERN REGION

PLANT PEST CONTROL DIVISION



KHAPRA BEETLE INSPECTION SUMMARY

REGION: Southern

PREPARED BY:

PERIOD (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1959

DATE PREPARED:

STATE (A)	INSPECTIONS: INITIAL (B)	INSPECTIONS: REPEAT (C)	INSPECTIONS: TOTAL (D)	SPECIMEN COLLECTIONS SUBMITTED FOR IDENTIFICATION (E)	INFESTED SITES THIS PERIOD (F)	TOTAL SITES INFESTED FROM BEGINNING (G)	SITES TO BE TREATED (H)	ESTIMATE OF VOLUME INFESTED THIS PERIOD (CU. FT.) (I)	TOTAL VOLUME INFESTED FROM BEGINNING* (EST. CU. FT.) (J)	TOTAL VOLUME INFESTED TO BE TREATED (K)
Arizona										
California										
New Mexico										
Republic of Mexico										
Alabama	32	100	132	11	0	0				
Arkansas	11	0	11	3	0	0				
Florida	21	9	30	11	0	0				
Georgia	4	10	14	1	0	0				
Mississippi	88	52	140	0	0	0				
N. Carolina	2	0	2	2	0	0				
Oklahoma	31	79	110	21	0	0				
S. Carolina	11	0	11	2	0	0				
Tennessee	18	14	32	1	0	0				
Texas	1,138	1,154	2,292	258	22*	22*	3	1,850,716**	1,850,716**	550,868
From 7/1/58 Total This Period	1,356	1,418	2,774	310	22*		3	1,850,716		550,868
Total From July 1										
Total From Beginning of Program	3,870	2,503	6,373	731		22*			1,850,716**	

* One site in Presidio County probable infestation.

** When treatment of all known infestations was completed in September 1959, this figure was reduced to 1,719,516 cu. ft.

*Represents first time infestations only.

PPC FORM 7-15 (JULY 1956)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Khapra Beetle — SUMMARY OF ASSOCIATED ACTIVITIES — Prepared by: _____

Region Southern — Fiscal year 1959

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Interp. Maps & Posters	
Florida			4							30		
Georgia			1							10		
Texas	4				4		28					
Total	4	-	5	-	4	-	28	-	-	40	-	-

KHAPRA BEETLE PROGRAM

• • •

PROGRAM ANNUAL REPORT
1959 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

_____

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1958 - June 30, 1959

In cooperation with
County, State, Federal, and Local Agencies

December 1, 1959

Oakland, California

Jim R. Dutton

Regional Supervisor

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HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

During the 1959 fiscal year, approximately 36,000 inspections were made, including both initial and repeat inspections; 41 infestations were found (36 new, 5 reinfestations); and 36 properties were treated having a total volume of 8,426,528 cubic feet. No khapra beetles were found in this Region beyond the three originally infested States of California, Arizona, and New Mexico.

After nearly two years of negative inspections in New Mexico, 13 properties were found infested during fiscal year 1959. During the same period and with inspection activity remaining about the same, Arizona infestation finds dropped from 46 to 21 and California, 32 to 7. Volume of infested properties found in 1959 was 4,764,963 as compared to 9,984,743 cubic feet in 1958.

Major Deviation from Work Plan

Pink bollworm eradication activities in Arizona necessitated some reduction of property inspection during the summer and fall months; however, the over-all planned detection program was achieved before the end of the year.

Khapra beetles were discovered in Texas, and among the infested properties was one establishment that supplied host materials to individual users and retailers in New Mexico. This necessitated increased detection activity and eradication efforts not anticipated.

Status of Program at Close of Year

Awaiting treatment at the close of the fiscal year were 8 new infestations and 1 reinfestation in Arizona, 1 reinfestation in California, and 1 new infestation in New Mexico.

Progress is being made toward eradication; however, a large amount of inspection, both initial and repeat, remains to be done.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

Planning of all phases of the work is among Plant Pest Control Division personnel, State Department of Agriculture

agencies concerned, and in California, with County Agricultural Commissioners where work is performed. Direction of the work is vested in the Plant Pest Control Division State Supervisor in Charge who acts in close cooperation with the State Department of Agriculture and counties concerned.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Program personnel maintain good working relationships with commercial establishments, farmers, property owners, and county agencies, advising them of infestation occurrence, regulatory requirements, sanitation measures, and related problems of mutual concern. Assistance was also given to owners of infested establishments in their treatment of commodities moved under certification.

Experienced personnel were lent to other Regions of the Plant Pest Control Division to instruct, assist, and advise in the approved methods of commodity treatments and in the preparation and fumigation of infested properties.

Technical assistance provided to program by cooperating agencies

The University of Arizona, Tucson, continued its khapra beetle population studies with respect to the effects of different host materials, sanitation, etc. The University of California Citrus Experiment Station at Riverside, California continued studies on the biology of the khapra beetle and attractants for use in detecting the pest. Specimen collections made during the course of survey in California are submitted to California Department of Agriculture, Bureau of Entomology for screening and determination. Specimen collections made in Colorado are submitted to the Colorado State University, and the Idaho collections to the University of Idaho for screening. At these universities all insects are eliminated from the collection, except Trogoderma species which are forwarded to Washington, D. C., where Entomology Research Division makes preliminary and final determination of khapra beetle collections.

Survey

Procedures or techniques used

Field

All accepted survey methods were employed--visual, screening, and trapping. The search for inspection aids continues, but at present there are no promising leads in sight.

Laboratory

Not applicable

Accomplishments

In some areas, the planned program for inspecting commercial and consumer properties was not completed. In the eleven Western States, 36,086 property inspections were made and 12,997 specimen collections were submitted for identification.

Statement of Crop Losses

As a result of the cooperative eradication effort, losses to stored grain products directly attributable to khapra beetles were negligible. As a matter of fact, it might be safely said that the program has resulted in considerable savings to the industry through self-imposed sanitary practices.

Control

Procedures or techniques used

There was no deviation from the approved program eradication techniques prescribed.

Accomplishments

Thirty-six infested properties, with a total volume of 8,426,528 cubic feet, were fumigated during the fiscal year. This required 83,743 pounds of methyl bromide.

Regulatory

Procedures or techniques used

Regulatory procedures set forth in Federal Domestic Quarantine No. 76 were strictly adhered to.

Accomplishments

Appropriate Federal and State quarantines promulgated by the infested states were effectively enforced.

Methods Improvement

Accomplishments

Use of "trap" bags developed a year ago as an adjunct to regular inspection methods was responsible for disclosing the presence of khapra beetles on one property.

Visual aids were used in acquainting personnel with program activities. Individual and group training in survey techniques was given new employees.

Other

Cooperation received during fiscal year

State and county personnel gave valuable assistance in survey, regulatory, and eradication phases of the work. In certain areas of Arizona, the United States Department of Interior, Bureau of Indian Affairs, assisted by providing personnel to aid in surveys and to act as interpreters and guides for Division personnel. In the infested States of Arizona, California, and New Mexico, direct appropriations allow the Departments of Agriculture to participate in surveys and contribute to treatment of infestations. Contract fumigations in California are financed by the State, with the Division furnishing technical assistance and methyl bromide. More than 50 percent of the inspection is done by State and County personnel in a number of the States in the Western Region.

Cooperative work needing strengthening another year

The continued cooperation between the Plant Pest Control Division and the states and industry involved is very important. In several instances the cooperative understanding needs strengthening and should be a prime responsibility of the supervisors in charge.

Associated activities and services

Program servicing

Color slides and movies were used extensively and contributed toward a better understanding of the khapra beetle program. They were used in orienting State, County, and Division personnel, acquainting them with survey and eradication.

Pictorial brochures were distributed as part of the program to keep industry alert to the khapra beetle menace.

RECOMMENDATIONS FOR COMING YEAR

Survey

The inspection program needs to be intensified in all states. Perhaps a review of the present situation is needed in order that a closer understanding of eradication achievement expectancy might be determined, which will permit better planning of a survey timetable and staffing of permanent personnel to accomplish the job. The use of all survey methods such as sieves and trap bags should be encouraged.

Eradication

The present program of fumigation should be continued, with every effort being placed on accomplishing treatment as soon as possible after properties are found to be infested.

Some consideration might be given to penalizing property owners whose premises become reinfested.

Regulatory

Fumigated establishments will be encouraged still further to request inspection of incoming seed and grain to insure against reinfestation.

Methods Improvement

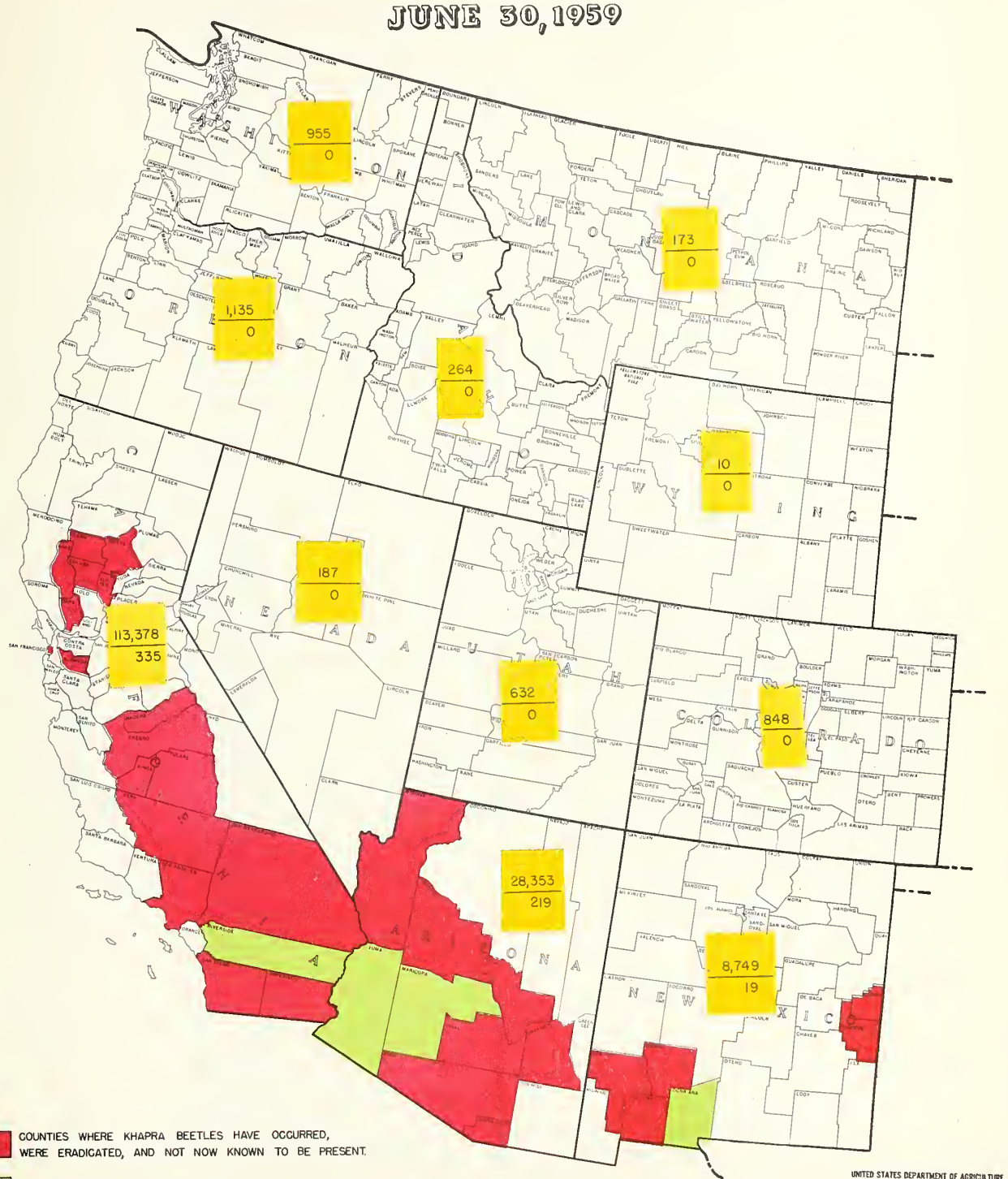
Every effort should be made to develop new survey aids such as attractants and light traps, and further studies should be made to evaluate such working tools as grain sieves and trap bags. Studies should be continued in order to improve fumigation methods and materials. An effective fumigant is needed that can be safely used on foodstuffs without leaving harmful residue and on seeds without inhibiting germination.

Other

Cooperative relationships with some states need strengthening, and program responsibility should be more clearly defined and adjusted to fit program needs.

KHAPRA BEETLE ERADICATION

JUNE 30, 1959



COUNTIES WHERE KHAPRA BEETLES HAVE OCCURRED, WERE ERADICATED, AND NOT NOW KNOWN TO BE PRESENT.

COUNTIES CURRENTLY INFESTED

0 / 0 — UPPER FIGURE: TOTAL INITIAL AND REPEAT PROPERTY INSPECTIONS.
LOWER FIGURE: TOTAL INFESTED PROPERTIES FOUND.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 1959

GPO 979052

SUMMARY OF ASSOCIATED ACTIVITIES

Khapra Beetle

Fiscal Year 1959

State	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest.Map & Posters	
Arizona	4	4	2	9	0	0	0	1		9,290	0	0
Colorado	2	2	1	1	0	0	0	0	0	0	0	0
Washington	2	2	0	0	0	0	1	0	200	0	0	2
Nevada	4	1	0	0	0	0	0	0	4	20	2	2
New Mexico	3	3	3	0	0	0	0	0	0	0	0	0
Oregon	1	1	0	0	0	0	0	0	50	0	0	2
Utah	2	4	4	0	0	0	4	0	8	100	6	2
Total	18	17	10	10	0	0	5	1	262	9,410	8	8

*Written by Plant Pest Control Division personnel for release direct or through cooperators.

Khapra Beetle

INSPECTION SUMMARY

Fiscal Year 1959

STATE	Inspections			Specimen Coll. Submitted for Ident.	Inf. Sites from Jul 1	Sites Inf. from Begin.	Sites to be Treated	Est. of Vol. Inf. from Jul 1 (cu. ft.)	Total Vol. Inf. from Beginning (est. cu. ft.)	Total Vol. Inf. to be Treated
	Initial	Repeat	Total							
Arizona	4,237	5,053	9,290	2,363	18	219	8	2,550,368	55,385,971	685,000
California	1,744	20,960	22,704	9,649	5	335	0	260,550	80,864,004	0
Colorado	7	184	191	207	0	-	-	-	-	-
Idaho	90	35	125	9	0	-	-	-	-	-
Montana	126	0	126	15	0	-	-	-	-	-
Nevada	4	44	48	3	0	-	-	-	-	-
New Mexico	1,910	811	2,721	656	13	19	1	1,338,888	1,778,808	57,024
Oregon	70	285	355	23	0	-	-	-	-	-
Utah	11	133	144	18	0	-	-	-	-	-
Washington	51	330	381	53	0	-	-	-	-	-
Wyoming	1	0	1	1	0	-	-	-	-	-
Total From July 1	8,251	27,835	36,086	12,997	36	573	9	4,149,806	XXXXXX	742,024
From Beginning of Program	72,171	82,513	154,684	47,918	XX	XXX	XX	XXXXX	138,028,783	XXXXX

Reinfested sites and volume not included

Khapra Beetle

TREATMENT SUMMARY

Fiscal Year 1959

TREATMENTS-CATEGORY 1

State	Properties Treated		Volume Treated (cu. ft.)		Methyl Bromide Used (Lbs.)	
	Fiscal Year 1959	Since Beginning	Fiscal Year 1959	Since Beginning	Fiscal Year 1959	Since Beginning
Arizona	13	211	2,350,524	54,718,971	24,617	514,609
California	8	335	870,324	80,864,004	6,407	648,722
New Mexico	12	18	1,280,864	1,721,784	7,740	11,625
Totals	33	564	4,501,712	137,304,759	38,764	1,174,956

PROPERTIES TREATED AND HELD FOR FINAL CLEARANCE INSPECTION - CATEGORY 2

State	Properties Treated		Volume Treated	
	Fiscal Year 1959	Since Beginning	Fiscal Year 1959	Since Beginning
Arizona	1	18	2,199,342	8,055,165
California	0	21	0	3,303,038
New Mexico	2	7	216,153	555,673
Totals	3	46	2,415,495	11,913,876

RETREATMENTS

State	Properties Treated		Volume Treated		Methyl Bromide Used (Lbs.)	
	Fiscal Year 1959	Since Beginning	Fiscal Year 1959	Since Beginning	Fiscal Year 1959	Since Beginning
Arizona	2	5	3,149,927	6,687,096	38,529	72,671
California	1	21	774,889	9,595,389	6,450	94,784
Totals	3	26	3,924,816	16,282,485	44,979	167,455

Khapra Beetle EXPENDITURES BY SOURCE AND ACTIVITY Fiscal Year 1959

	1	2	3	4	5	6		8
Source of Cash & Equivalent*	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
Plant Pest Control Division	$ 40,260	$ 6,750	$288,065	$174,100***	$ 11,200	$ 2,750	$5,175	$528,300
Other Organizations (Name)								
State Depts. of Agriculture	18,760	8,600	107,700	76,500	4,040	40	2,650	218,290
Subtotal Other Organizations	18,760	8,600	107,700	76,500	4,040	40	2,650	218,290
Total (of PPC & Other)	59,020	15,350	395,765	250,600	15,240	2,790	7,825	746,590
Contributed Services**								
Depts. of Agriculture								
States	3,000	1,325	3,950	---	21,400	---	400	30,075
Counties	10,000	400	60,000	2,500	21,600	---	---	94,500
Extension Service	600	---	200	---	---	---	---	800
Universities	200	250	550	---	---	---	---	1,000
Individuals	---	---	2,000	200	---	---	---	2,200
Total	13,800	1,975	66,700	2,700	43,000	---	400	128,575
Grand Total	$ 72,820	$ 17,325	$462,465	$253,300	$ 58,240	$ 2,790	$8,225	$875,165

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

*** Includes $17,650 for Methyl Bromide for use in Southern and Mexican Regions.

Khapra Beetle

COOPERATIVE AID RECEIVED

Fiscal Year 1959

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash	Cash and Equivalent Aid*			Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
		Personal Services	Equipment & Supplies	Space				
State Depts. of Agric.								
Arizona		$ 27,600	$ 21,100	$ -	$ 48,700	$ 7,300	$ 56,000	
California		93,500	30,000	-	123,500	18,900	142,400	
Colorado		7,500	-	-	7,500	-	7,500	
Idaho		50			50	450	500	
Nevada		1,700	-		1,700	-	1,700	
New Mexico		13,400	13,400	-	26,800	1,000	27,800	
Oregon		1,000	-		1,000	275	1,275	
Utah		690	50	-	740	-	740	
Washington		8,300	-	-	8,300	2,150	10,450	
Counties								
California		-	-	-	-	94,100	94,100	
New Mexico		-	-	-	-	400	400	
Exten. Services								
Idaho		-	-	-	-	200	200	
Oregon		-	-	-	-	100	100	
Washington		-	-	-	-	500	500	
Universities								
Oregon		-	-	-	-	500	500	
Washington		-	-	-	-	500	500	
Individuals								
New Mexico		-	-	-	-	200	200	
Oregon		-	-	-	-	1,000	1,000	
Washington		--	-	-	-	1,000	1,000	
Total		$153,740	$64,550	-	$218,290	$128,575	$346,865	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.